

RuralAmerica

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On the cover:

Railcars awaiting unloading
at a feed mill.

(Photo by Jim Strawser
from Grant Heilman Photography, Inc.)



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This issue of Rural America launches a new format incorporating material formerly appearing in *Rural Conditions and Trends*, which ceased publication last year. *Rural America* will now combine feature articles with a new Rural Updates section containing tables and short articles that present the latest information on rural social and economic conditions, plus changes in rural development programs and policies. *Rural America* has also now become a quarterly. Individual rural updates will appear in the earliest issue feasible after data become available; in many cases, additional data will also be available on the ERS website at < <http://www.ers.usda.gov/> > .

Most of the articles in this issue deal with some facet of rural business. The first two discuss agriculture and its links with the nonfarm rural economy. Doris J. Newton and Robert Hoppe explore the diversity of U.S. farms. ERS has recently developed a new classification system that not only groups farms by size but also divides small farms into categories that better reflect the importance of the farm to the operator's income and position in the life cycle. The four groups are limited-resource farms, retirement farms, residential/lifestyle farms, and farming-occupation farms where operators consider agriculture to be their major occupation. Most farms are small farms whose owners depend on off-farm income and benefit from a healthy nonfarm economy. On the other hand, in areas with concentrations of larger farms, agricultural activities remain important to local economies.

One strategy increasingly used to benefit both agricultural and rural economies is the promotion of value-added agriculture. Maureen Kilkenny and Gerald Schluter have surveyed the programs in all 50 States and assessed their importance. States use value-added policies to promote the use and recognition of State-grown products and to attract agro-industries. While farmers would prefer to have more agro-industries in rural areas, large firms are more likely to succeed in cities, where they can draw on the products of many farms and have access to a diverse labor force, better infrastructure, and related support businesses. Small firms, on the other hand, are often well-suited to rural locations, especially in areas with surplus labor. F. Larry Leistritz and Randall S. Sell take a closer look at the effects of agricultural processing plants in rural areas. A survey of North Dakota community leaders and residents in places with new processing plants shows that the new plants have improved incomes and increased job opportunities for local residents; local leaders have been pleased with the results.

Another way to encourage new companies to locate in rural areas is to create or assist rural venture capital firms. Most venture capital investments are in urban areas, but some venture capital programs aimed at small market areas have recently appeared: public venture capital funds, public funds with private management, and community-level equity funds. David L. Barkley and Deborah M. Markley investigate 11 such programs. They report that the most successful funds of whatever type have experienced and incentive-driven management, suffer little political pressure, allocate enough resources to finding investment opportunities, and are strongly oriented toward profitability.

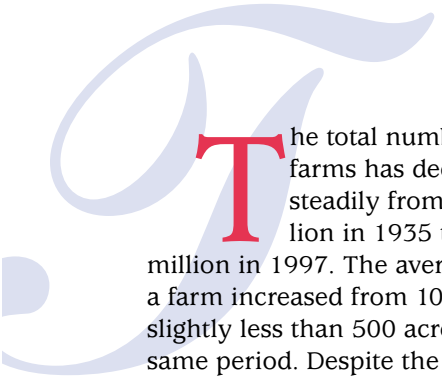
Workforce training has become an important rural development issue, as rural workers are often thought ill-prepared for the sort of jobs that will become available in the future. Wayne Jesswein, Richard Lichty, and Carolyn Zanko argue that looking at such preparedness regionally may alter that view. Their surveys of firms and workers in northeast Minnesota and northwest Wisconsin found that most job openings there did not call for high-tech skills and that relatively few firms reported workforce difficulties due to the abilities, training, or education of their workforce.

Our Rural Updates section opens with an article by Fred Gale and David McGranahan using the latest (1998) data on nonmetro jobs and earnings. Nonmetro jobs have continued to grow, but from 1995 to 1998 they did not grow as fast as metro jobs, especially in producer services. The gap between metro and nonmetro earnings has widened further: nonmetro jobs in 1998 paid only 69 percent of what metro jobs paid. Alex Majchrowicz and William Edmondson report on employment in farm-linked industries using two different approaches. Majchrowicz discusses farm and farm-related employment, two-thirds of which is in wholesale and retail trade. He includes data by States, with a breakdown for nonmetro areas. Edmondson updates food and fiber system employment and GDP share, finding that the system's share of GDP continues to rise despite a downward trend in employment. He also presents 1999 data on economic activity related to agricultural trade.

Douglas E. Bowers

Financial Well-Being of Small Farm Households Depends on the Health of Rural Economies

Doris J. Newton
Robert A. Hoppe



The total number of U.S. farms has declined steadily from 6.8 million in 1935 to about 2 million in 1997. The average size of a farm increased from 100 acres to slightly less than 500 acres over the same period. Despite the increase in average farm acreage, most farms today are small since the current farm definition requires sales of only \$1,000 of agricultural products for an establishment to be classified as a farm. Nine out of ten U.S. farms are classified as small (gross sales under \$250,000), and half of U.S. farms have annual sales less than \$10,000. At the other extreme, some farms have sales in the millions.

But, farms also differ in characteristics other than their level of sales. For example, they may differ in production practices, such as tillage and pest management techniques, and in their use of production or marketing contracts. They also differ in their use of family and hired labor and how they market their products. They may differ in the size of their asset base, their sources of financing, and how they

The number of farms has decreased since the 1930s, and average size—measured in acres—has increased. Most farms are small, and more than half have sales less than \$10,000. As a result, households operating small farms rely heavily on off-farm income from the local economy. At the other extreme, some farms have sales in the millions. These and other differences present challenges when analyzing the economic structure of agriculture and developing farm policy recommendations. USDA's Economic Research Service has developed a classification to address variations across farms, with an emphasis on small farms.

control risk. And, finally, farm households often differ widely in their reliance on off-farm income and off-farm work. In general, smaller farms rely more heavily on off-farm income and work.

Classifying Farms

The great diversity among farms makes it problematic to talk about farms as if they were a homogeneous group. The Economic Research Service developed a typology or classification system to divide farms into eight mutually exclusive, more homogeneous groups (see “Defining the Farm Typology”). The first five of the eight groups are for small farms, since even small farms can vary in their characteristics.

The ERS typology uses the definition of “small farm” developed by the National Commission on Small Farms, instituted in 1997. The Commission used \$250,000 in gross sales as its cutoff between small and large farms in its report, *A Time to Act*, released in January 1998. The farm typology focuses on the “family farm,” defined here

as any farm organized as a sole proprietorship, partnership, or family corporation. According to 1998 ARMS data, about 98 percent of U.S. farms are family farms. Family farms exclude farms organized as nonfamily corporations or cooperatives, as well as farms with hired managers.

Other definitions of the family farm exist, and a variety of definitions, implicit and explicit, have been used by Congress, researchers, and others (U.S. Department of Agriculture, Economic Research Service). These definitions are generally more restrictive than the one used in the farm typology, however. Some definitions, for example, exclude farms with the amount of hired labor or total labor exceeding some minimum or farms with contracting arrangements, which would tend to eliminate larger farms. Excluding such farms would make sense only if the focus is smaller family farms. Other definitions include only operations where the operator's main occupation is farming or where the farm provides at least half-time employ-

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ment, which would tend to exclude smaller farms.

In contrast, the ERS typology is more inclusive, but allows a focus on various groups of large and small farms when necessary. Looking at all farms helps in understanding the contributions of various types of farms to agricultural production, the variation in farm households' dependence on farming, and regional variations in the location of farms by size.

Share of Production

Over 90 percent of U.S. farms are classified as small family farms but they accounted for only 33 percent of total agricultural output. Agricultural production is highly

concentrated in large and very large family farms (table 1). Farms with annual sales of \$250,000 or more made up 8 percent of all farms in 1998, but accounted for 53 percent of the total production of agricultural products. Small family farms produced a larger share of several specific commodities. For example, small farms' share of the value of production was 62 percent for hay, 54 percent for tobacco, 49 percent for soybeans, 47 percent for wheat, 47 percent for corn, and 40 percent for beef. At the other extreme, small farms accounted for only 26 percent of hogs, and 11 percent of vegetable, fruit, and nursery products.

Most of the production by small farms was concentrated in the farming-occupation/high-sales and farming-occupation/low-sales groups (17 and 8 percent of the total value of production, respectively). Although 62 percent of all U.S. farms were classified as limited-resource, retirement, and residential/lifestyle small farms, these farms produced only 8 percent of farm output. About three-fourths of the farms in these groups had extremely low sales, less than \$10,000.

Nevertheless, small farms collectively held 69 percent of farm assets, and 68 percent of the land. As custodians and managers of the bulk of farm assets—including land—small farms weigh heavily in natural resource and environmental policy. For example, retirement farms alone accounted for 29 percent of the land in the Conservation Reserve and Wetland Reserve Programs (CRP and WRP). Retired farmers have scaled back their farming activities and thus may have had excess land available to put to conservation uses.

Small farms, in fact, received a large share (82 percent) of conservation program payments. Retirement and residential/lifestyle farms together received about half of the conservation program payments. In contrast, about half of commodity program payments went to high-sales and large farms, reflecting their specialization in cash grains, which includes most program-eligible commodities.

Sources and Level of Income

For most small farm groups, virtually all income came from off-farm sources (table 2). On average, farming made a substantial contribution to household income only for groups with sales of \$100,000

Defining the Farm Typology

Small family farms (sales less than \$250,000)

- **Limited-resource farms.** Small farms with sales less than \$100,000, farm assets less than \$150,000, and total operator household income less than \$20,000. Operators may report any major occupation, except hired manager.
- **Retirement farms.** Small farms whose operators report they are retired. *
- **Residential/lifestyle farms.** Small farms whose operators report a major occupation other than farming. *
- **Farming-occupation farms.** Small farms whose operators report farming as their major occupation. *
 - **Low-sales.** Sales less than \$100,000.
 - **High-sales.** Sales between \$100,00 and \$249,999.

Other farms

- **Large family farms.** Sales between \$250,000 and \$499,999.
- **Very large family farms.** Sales of \$500,000 or more.
- **Nonfamily farms.** Farms organized as nonfamily corporations or cooperatives, as well as farms operated by hired managers.

*Excludes limited-resource farms whose operators report this occupation.

Table 1

Selected structural characteristics of farms, by farm typology group, 1998*Most farms are small, with half selling less than \$10,000 annually*

Item	Small family farms					Large family farms	Very large family farms	Non-family farms	All farms
	Limited-resource	Retirement	Residential/lifestyle	Farming-occupation/low-sales	Farming-occupation/high-sales				
Number									
Total farms	150,268	290,938	834,321	422,205	171,469	91,939	61,273	42,296	2,064,709
Percent									
Distribution of:									
Farms	7.3	14.1	40.4	20.4	8.3	4.5	3.0	2.0	100.0
Value of production	0.6	1.4	6.1	7.8	17.1	16.8	36.7	13.6	100.0
Acres owned	1.2	10.2	15.7	24.4	16.8	11.2	10.0	10.5	100.0
Farms with sales less than \$10,000	79.8	75.5	70.2	34.6	0.0	0.0	0.0	31.1	52.5
Distribution of CRP and WRP acres	3.8	28.9	20.6	17.5	13.5	8.2	3.9	3.5	100.0
Positive net cash income	35.2	39.6	31.6	49.5	81.7	87.1	91.7	55.9	45.6
Type of farm:									
Cash grain	*10.0	7.1	14.0	22.6	42.8	44.1	20.3	25.0	18.6
Other field crops	22.1	31.6	24.5	15.9	10.7	12.6	13.5	21.9	21.5
High-value crops	d	*7.4	7.8	6.6	4.9	7.3	14.0	20.5	7.7
Beef	40.6	39.0	32.4	36.6	13.0	9.7	8.8	14.7	31.1
Hogs	d	d	d	2.3	4.2	4.7	5.9	d	2.5
Dairy	d	d	d	6.4	20.4	15.6	14.0	d	4.5
Other livestock	*15.7	*14.5	18.0	9.5	4.0	6.0	23.5	*11.5	14.0

d = Data suppressed due to insufficient observations.

* = Standard error is between 25 and 50 percent of the estimate.

Source: USDA, Economic Research Service, 1998 Agricultural Resource Management Study, version 1.

or more, and farming's share of income increased with sales.

Except for households with retired operators, at least half of off-farm income was earned, coming from a job or self-employment. This reflects the heavy participation in off-farm work by operators and their spouses (table 3). Off-farm work by farmers and their spouses diminished with increasing sales for high-sales, large, and very large farms, although spouses within each group were more likely to work off-farm than operators. Even on very large family farms, nearly

two-fifths of spouses worked off-farm. Between one-fourth and one-third of the working spouses in each typology group worked for the government, which includes local school districts.

Households operating very large farms received only 16 percent of their income from off-farm sources, much less than the other groups (table 2). Households operating very large farms had the highest average household income, \$209,100, about four times the average for all U.S. households (\$51,900 in 1998).

Households operating residential/lifestyle farms or large farms also had an average income above the average for all U.S. households, but the sources of income differed between the two groups. Households with residential/lifestyle farms received practically all of their income from off-farm sources, largely earned. One-third of the residential/lifestyle farms specialized in beef (table 1), which—in the case of cow-calf enterprises—can have relatively low labor requirements that mesh well with off-farm work. In contrast, households with large

Table 2

Income and net worth of farm operator households, by farm typology group, 1998*Most households operating small farms rely heavily on off-farm income*

Group	Operator households	Total household income			Off-farm income		Total net worth		
		Average amount	From off-farm sources ¹	Percent of U.S. aver. household income ²	Average amount	From earned sources	Average amount	From off-farm sources	Percent of U.S. aver. household net worth ³
		<i>Dollars/household</i>	<i>Percent</i>		<i>Dollars/household</i>	<i>Percent</i>	<i>Dollars/household</i>	<i>Percent</i>	
All operator households	2,022,413	59,734	88.1	115.2	52,628	74.4	492,195	17.0	174.2
Farm typology:									
Small family farms									
Limited-resource	150,268	9,924	132.5	19.1	13,153	53.3	78,718	16.0	27.9
Retirement	290,938	45,659	103.3	88.1	47,158	34.9	535,943	19.8	189.7
Residential/lifestyle	834,321	72,081	106.0	139.0	76,390	88.7	347,909	26.3	123.2
Farming-occupation									
Low-sales	422,205	34,773	106.9	67.1	37,186	57.7	576,402	14.2	204.0
High-sales	171,469	50,180	57.2	96.8	28,717	72.3	669,458	10.4	237.0
Large family farms	91,939	106,541	44.4	205.5	47,252	65.7	944,533	9.0	334.3
Very large family farms	61,273	209,105	15.9	403.2	33,240	65.1	1,508,151	6.8	533.9

Note: Household data are not collected for nonfamily farms.

¹Income from off-farm sources can be more than 100 percent of total household income if earnings of the operator household from farming activities are negative.²Average farm household income divided by U.S. average household income (\$51,855) from the Current Population Survey (CPS).³Average farm household net worth divided by U.S. average household net worth (\$282,500) from the Survey of Consumer Finances (SCF).

Source: 1998 Agricultural Resource Management Study (ARMS) for farm operator and farm household data. Current Population Survey (CPS) for U.S. average household income. Survey of Consumer Finances (SCF) for U.S. average household net worth.

family farms received only 44 percent of their income from off-farm sources. The most common specialization for large family farms was cash grain.

Households operating retirement farms or high-sales small farms had an average income that did not differ from the average for all U.S. households by a statistically significant amount (table 2). Nearly all the income of households with retirement farms came from off the farm, mostly from unearned sources such as Social Security. Households operating high-sales small farms relied much more heavily on farming in comparison with those operating retirement farms, with farming accounting for 43 percent of the group's total

household income, on average. About two-thirds of the farms in this group specialized in cash grains or dairy (table 1).

The remaining groups—low-sales and limited-resource farm households—received income below the average for all U.S. households (table 2). Most of their income came from off-farm sources, with unearned income making up nearly half of their off-farm income. This reflects the relatively high percentage of elderly farmers in these groups. Approximately a third of limited-resource farmers reported they were retired. Lower-sales farmers reported farming as their major occupation, but 36 percent were over age 65, and would receive

Social Security if they scaled back their farming activities and restricted their off-farm work.

Except for households operating limited-resource farms, each group of households had an average household net worth well above the \$282,500 average for all U.S. households (table 2). Although many farm households relied heavily on off-farm sources for income, most operator household wealth was invested in farm assets, regardless of typology group.

Location

Some of the typology groups are concentrated regionally (table 4). As one would expect from their specialization in dairy and cash grain, 62 percent of high-sales

Table 3

Off-farm work by farm operators and spouses, by typology group, 1999*Even on very large family farms, two-fifths of spouses worked off farm*

Item	Small family farms					Large family farms	Very large family farms	All family farms
	Limited-resource	Retirement	Residential/lifestyle	Farming-occupation/low-sales	Farming-occupation/high-sales			
Number								
Total households	126,920	297,566	931,561	480,441	175,370	77,314	58,403	2,147,576
Percent								
Operator works off-farm	38.4	15.4	100.0	31.4	24.4	22.9	16.2	58.0
Type of work for operators with off-farm work: ¹								
Employed by another farm	d	d	d	12.8	d	d	d	3.0
Employed by a private firm	47.1	45.6	56.7	38.8	42.7	42.6	33.9	52.9
Employed by government	d	d	14.9	17.2	20.1	15.8	12.1	15.1
Self-employed, another farm	d	d	d	d	d	d	d	*1.0
Self-employed, nonfarm business	d	d	21.3	22.3	20.6	28.0	29.9	21.5
Other	d	d	3.1	d	d	d	d	3.7
Spouse works off-farm	13.1	23.8	62.8	41.5	48.7	46.2	39.0	47.3
Type of work for spouses with off-farm work: ¹								
Employed by another farm	d	0.0	d	d	d	d	d	*0.7
Employed by a private firm	d	46.2	58.4	53.5	52.5	51.5	48.9	55.7
Employed by government	d	34.3	25.4	28.2	33.0	34.0	36.4	27.6
Self-employed, another farm	d	d	0.0	d	d	d	d	d
Self-employed, nonfarm business	d	d	12.5	11.5	8.0	8.7	8.5	11.8
Other	d	d	d	4.2	4.9	d	d	3.4
Off-farm work by operator and spouse:								
Only operator works	30.5	7.5	37.2	13.1	10.0	9.1	8.8	23.3
Only spouse works	d	16.0	0.0	23.3	34.4	32.4	31.6	12.6
Neither works	56.3	68.7	0.0	45.4	41.2	44.7	52.2	29.4
Both work	d	*7.9	62.8	18.2	14.3	13.8	7.3	34.7

Note: Household data are not collected for nonfamily farms. d = Data suppressed due to insufficient observations.

* = Standard error is between 25 and 50 percent of the estimate.

¹Detail may not add to 100 percent because refusals are not shown separately.

Source: USDA, Economic Research Service, 1999 Agricultural Resource Management Study.

farmers lived in the Lake States, Corn Belt, and Northern Plains. Similarly, 46 percent of large farms were located in the Corn Belt and Northern Plains, which reflects the large farm specialization in cash grain. Forty-two percent of limited-resource farmers lived in Southern regions.

About two-thirds of all U.S. farms were located in nonmetro counties. About three-fourths of farming-occupation small farms and large family farms were located in nonmetro counties, a higher share than the national average. In addition, about two-fifths of high-sales small farms and large family

farms were located in nonmetro counties not adjacent to a metro area, compared with one-third of all farms.

By definition, farming-dependent counties, where farming accounts for at least 20 percent of earnings, have a large local farm sector relative to other types of

Table 4

Location of farms, by farm typology group, 1998*Family farms with sales greater than \$100,000 are more likely to be located in farming-dependent counties*

Item	Small family farms					Large family farms	Very large family farms	Non-family farms	All farms
	Limited-resource	Retirement	Residential/ lifestyle	Farming-occupation/ low-sales	Farming-occupation/ high-sales				
Number									
Total farms	150,268	290,938	834,321	422,205	171,469	91,939	61,273	42,296	2,064,709
Percent									
Region:									
Northeast	d	*5.4	8.7	7.7	9.2	6.7	5.8	*8.6	7.7
Lake States	d	8.6	9.4	10.1	16.7	13.5	6.6	*8.6	10.2
Corn Belt	d	15.2	20.7	18.1	27.5	26.0	18.0	15.9	20.4
Northern Plains	d	d	5.8	10.5	18.0	20.0	8.5	d	8.5
Appalachia	18.5	16.8	16.1	13.2	4.9	8.5	9.3	d	14.2
Southeast	*7.9	10.4	7.3	6.8	3.1	4.1	13.2	10.2	7.4
Delta	8.1	*6.8	3.7	3.2	2.5	3.9	11.6	*3.3	4.5
Southern Plains	7.7	13.9	14.0	16.2	6.3	5.6	6.3	*11.0	12.7
Mountain	d	7.3	7.2	7.2	6.0	5.4	5.1	*10.7	6.7
Pacific	d	*10.6	7.2	7.0	5.8	6.4	15.7	14.9	7.9
Metro-nonmetro status ¹									
Metro	34.0	40.9	37.0	26.1	23.0	26.5	31.5	49.2	33.5
Nonmetro	66.0	59.1	63.0	73.9	77.0	73.5	68.5	50.8	66.5
Adjacent	32.3	32.3	32.3	38.5	35.2	30.7	31.5	22.2	33.5
Nonadjacent	33.8	26.9	30.7	35.4	41.8	42.8	36.9	28.6	33.0
Economic specialization:									
Metro counties	34.0	40.9	37.0	26.1	23.0	26.5	31.5	49.2	33.5
Nonmetro counties	66.0	59.1	63.0	73.9	77.0	73.5	68.5	50.8	66.5
Farming-dependent counties ²	*7.5	10.8	7.8	17.0	26.8	28.0	19.5	12.8	13.0
Other nonmetro counties	58.5	48.3	55.2	56.9	50.2	45.5	48.9	38.1	53.4

d = Data suppressed due to insufficient observations. * = Standard error is between 25 and 50 percent of the estimate.

¹The U.S. Office of Management and Budget (OMB) defines metro areas as geographic areas with a large population nucleus (generally at least 50,000 inhabitants), plus adjacent communities that are socially and economically integrated with that nucleus. Metro designations as of 1993, which identified 813 metro counties, are used here. The 2,276 nonmetro counties are a residual, the part of the Nation lying outside metro areas. Nonmetro counties are divided into two groups: those adjacent to metro areas (991 counties) and those that are not adjacent (1,285 counties).

²There are 556 farming-dependent nonmetro counties, where farming accounted for at least 20 percent of earned income over the 3 years from 1987 to 1989.

Source: 1998 Agricultural Resource Management Study (ARMS), version 1.

business. Not surprisingly, family farms with sales of \$100,000 or more were more likely than farms in general to be located in farming-dependent counties. Between 20 and 28 percent of high-sales small farms, large farms, and very large farms were located in these counties. In contrast, only 13 percent of

all U.S. farms were located in farming-dependent counties.

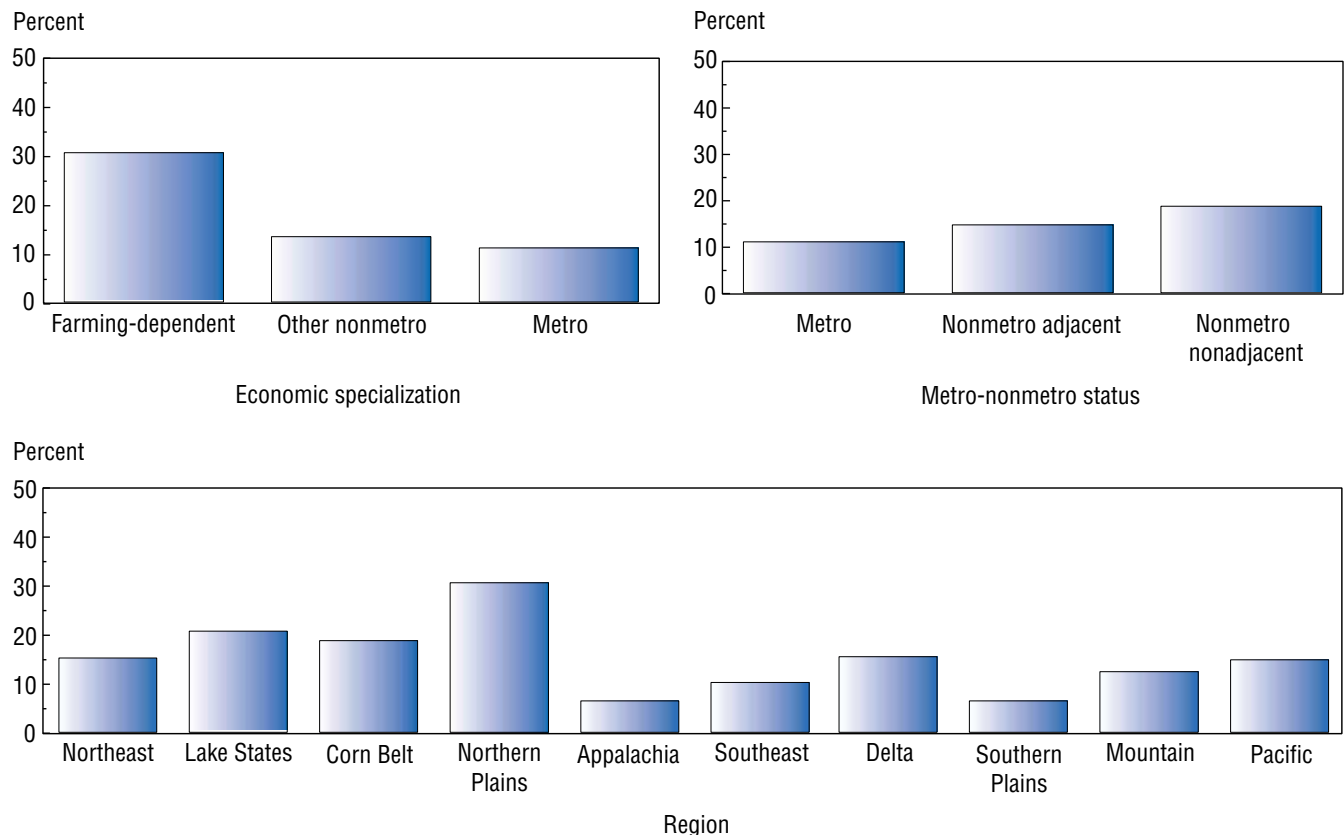
So far, the emphasis of this section has been the distribution of particular typology groups across geographic areas. However, it is also important from a rural development perspective to examine the composition of farms within particular geographic areas. Farming can

still provide an economic stimulus where larger farms are concentrated. For example, in farming-dependent counties, 31 percent of all farms were family farms with sales of at least \$100,000, compared with 14 percent in the remaining nonmetro counties and 12 percent in metro counties (fig. 1). The Northern Plains also

Figure 1

Family farms with sales of \$100,000 or more as a share of all farms in selected geographic areas, 1998

Family farms with sales of at least \$100,000 make up a large share of farms in farming-dependent counties, in the Northern Plains, and in nonadjacent counties



Note: Family farms with sales greater than \$100,000 include high-sales small farms, large family farms, and very large family farms.
Source: USDA, Economic Research Service, 1998 Agricultural Resource Management Study, version 1.

had a high percentage (31 percent) of farms with sales of \$100,000 or more. The share of farms with sales of at least \$100,000 was larger in nonmetro counties adjacent to a metro area (16 percent) than in metro counties (12 percent), and larger still in nonmetro counties not adjacent to a metro area (20 percent). Fewer off-farm job opportunities may help explain why farms were larger in farming-dependent counties, in the Northern Plains, and in nonadjacent nonmetro counties.

Most of the economic stimulus provided by farmers occurs locally, regardless of typology group. Operators do not travel particularly long distances to make purchases (table 5). For all farms (in 1993), the average distance to sources of household supplies (12 miles) and farm supplies (13 miles) was less than the average distance to sources of durables (20 miles) and farm machinery (21 miles). Many smaller towns have stores where farmers can buy household and farm supplies. Farmers may need to travel farther to find towns selling the more expensive and less fre-

quently purchased durables and farm machinery. Technological changes—especially purchases via Internet—may alter these relationships. According to 1999 ARMS data, 15 percent of the 634,000 farms with Internet access used e-commerce to purchase livestock and crop inputs. Twenty-five percent of these e-commerce farms sold livestock via the Internet.

Implications for Rural Development

Great diversity exists in U.S. farms. In part, this occurs because only \$1,000 of product sales is nec-

essary for an establishment to qualify as a farm, and most family farms classified as limited-resource, retirement, and residential/lifestyle have sales less than \$10,000. Many family farms are too small for the farm to do more than supplement off-farm income. At the other extreme, very large family farms have sales of at least \$500,000 and obtain nearly all of their income from farm sources.

Farm operators in each typology group rely to some extent on off-farm income. On average, virtually all income comes from off-farm sources for households operating limited-resource, retirement, residential/lifestyle, or low-sales farms. Even households with large and very large farms receive substantial off-farm income (an average of \$47,300 and \$33,200, respectively), although most of their income comes from farming activities. As a result, a healthy local nonfarm economy can help farm operators and their house-

holds by creating opportunities to earn off-farm income.

Farming contributes to economic activity in rural areas because farmers tend to make purchases locally, even those operating larger farms. However, new technologies such as the Internet could alter this. Farm business expenditures for limited-resource, retirement, and residential/lifestyle

farms are fairly low, since most of these farms have sales less than \$10,000. Nevertheless, households operating these farms make consumption expenditures. In addition, although residential/lifestyle farms produce little, they provide labor to local economies through the off-farm work of the farm operators, their spouses, and any other household members who may work.



Farm near Beallsville, Maryland. Photo courtesy Jack Harrison

Table 5

Distance to sources of purchases, by farm typology group, 1993

Most farm purchases are made close to home

Item	Small family farms					Large family farms	Very large family farms	All farms
	Limited-resource	Residential	Residential/lifestyle	Farming occupation/low-sales	Farming occupation/high-sales			
Average miles								
Household supplies ¹	11	10	11	14	13	13	13	12
Durables ²	18	19	20	23	21	18	22	20
Farm machinery ³	19	16	21	23	22	25	32	21
Farm supplies ⁴	12	12	13	15	13	13	21	13

Note: Data on purchases were not collected for nonfamily farms.

¹Groceries, clothes, supplies for the home, etc.

²Cars, trucks, furniture, and household appliances.

³Excludes trucks but includes implements.

⁴Seed, feed, chemicals, parts, fuels, and other farm-related goods and services.

Source: USDA, Economic Research Service, 1993 Farm Costs and Returns Survey, version 3.

An Earlier Classification

Gale and Harrington (1993) identified several myths—or commonly held beliefs—about the structure of U.S. agriculture. One of these myths holds that most farms are similar, resembling homesteads of the past, a unified block of modest-sized operations. In reality, farms are diverse, and have always been so. As pointed out over 50 years ago in the *Journal of Farm Economics*:

With so much diversity among farms the averages for all farms are of little significance. Such items as average income per farm and per farmer as commonly presented include hundreds of thousands of units which do not accord with the concept of a farm which is in the minds of most of the people using these data. Data are included for thousands of farmers who have retired to small acreages; for many suburban estates owned by men of large income whose contribution to agricultural income is nevertheless insignificant . . . Yet the concept in the mind of the user of such data more often than not is that of a fairly substantial commercial farm such as is common through the great crop-producing areas of the country (Benedict et al.).

In recognition of this diversity, a classification of farms was developed for use in the 1945 Census of Agriculture. The classification arose from the discussions of a joint committee of the U.S. Department of Agriculture and the Bureau of the Census (Bachman and Jones) and the article cited above. Groups in the classification were based primarily on the value of production and work off the farm:

- **Large-scale farms** (value of production of \$20,000 or more).
- **Large commercial family farms** (value of production from \$8,000 to \$19,999).
- **Medium commercial family farms** (value of production from \$3,000 to \$7,999).
- **Small commercial family farms** (value of production from \$1,200 to \$2,999).
- **Small-scale farms** (value of production from \$500 to \$1,199 and operator works off-farm less than 100 days per year).
- **Part-time units** (value of production from \$250 to \$1,199 and operator works off-farm 100 days or more).
- **Nominal units** (value of production less than \$250, or value of production between \$250 and \$499 if the operator worked less than 100 days off the farm.)

The Census Bureau continued to publish statistics using this classification—with modifications made over time—until 1974. Changes in prices and technology probably explain why the classification was discontinued (Stanton). Since then, the ERS typology is the first farm classification system based largely on sales class and the operator's time commitment to farming to be used extensively by a Federal agency.

Despite their reliance on off-farm income, operators of many small farms may be interested in improving their earnings from farming activities through such measures as extension education, innovative marketing programs, and credit targeted specifically at small farms. Trying to raise earnings from farming may be particularly appropriate for limited-resource farmers whose income from all sources is so low. Even modest improvements in household income could be important to these low-income farm households.

Agricultural production is concentrated in large and very large farms. However, low- and high-sales small farms account for about 25 percent of all agricultural production. Small farms—as a group—also produce larger portions of specific commodities, including hay, tobacco, soybeans, wheat, corn, and beef. Thus, small farms are more important to food and fiber production and local economies than their share of total production suggests.

Finally, small farms hold about 69 percent of farm assets, including 68 percent of the land. Thus, small farms are important in any discussions regarding land use, natural resources, or the environment. Retirement farms alone account for 29 percent of the land enrolled in the CRP and WRP though they represent only 10 percent of all farmers' land. Small farms' land is also important to local economies, since it provides a tax basis for property taxes and helps maintain the rural

landscape, which is important in areas where local businesses depend on tourism (Steele).

In contrast, commodity program payments are most relevant to high-sales small farms and large family farms. These farms receive about half of commodity program payments. Farm programs making payments proportional to production will necessarily provide benefits to farms (and regions) producing the commodities in question. **RA**

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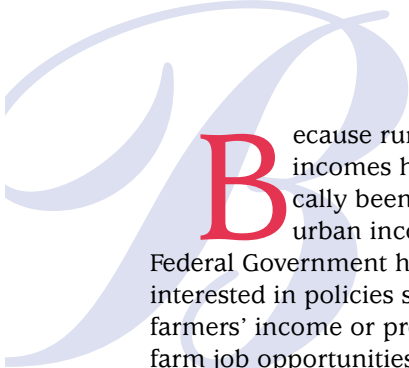
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Value-Added Agriculture Policies Across the 50 States

Maureen **Kilkenny**
Gerald **Schluter**



Because rural per capita incomes have historically been lower than urban incomes, the Federal Government has long been interested in policies supporting farmers' income or promoting non-farm job opportunities in rural areas. Many States also have policies that address these concerns. We can get a better understanding of efforts to support farmers' income and provide job growth by looking at State programs, particularly programs of State assistance to businesses that process agricultural commodities. In this article, we define value-added agriculture, describe these policies across the 50 States, and discuss how the various policies may work.

The production of primary agricultural commodities is just one part of agribusiness's contribution to national income and output. Farming alone employs less than 2 percent of the U.S. workforce, and generates an equivalent portion of U.S. GDP. The U.S. agro-industrial

State support for value-added agriculture has a long history. Currently, every State explicitly supports value-added agriculture in some way. The programs offered relate to the types of agro-industry in each State. State-grown product promotion programs are the most popular. At least 37 States target financial and technical assistance to businesses that use farm products. The effect of agro-industry support on rural income depends on its impact on new business location, productivity, rural unemployment, and whether or not owners and employees are in rural areas.

complex, however, employs 18 percent of the workforce (25 million persons) and returns \$1.4 trillion in income to the people who work, own, or invest in the industries. That income is the value added originating in farming and in agricultural handling and processing sectors.

The United States specializes in raw agricultural commodities, exporting 47 percent of the wheat produced during the 1999-2000 crop year, 21 percent of the corn, and 33 percent of the soybeans without further processing. The United States is a net importer of processed products: for example, 19 percent (by weight) of the canned foods consumed are imported. What if the United States were to do more processing before exporting, or processed a larger share of domestic output for local consumption? Could this bring higher returns to U.S. farmers? Can such activities reduce rural underemployment and help rural areas

capture a larger share of national income? These are the types of questions raised at the national level.

State governments and rural citizens are more concerned about local income than about international trade. Farmers want to know why there aren't more and closer processing facilities at the next stage of the marketing chain. Nonfarmers want more job opportunities. Locally, rural people are interested in such questions as:

- How does net farm income depend on the number and locations of processors?
- What determines the number and location of processing facilities when there are no government programs?

This article discusses these issues and describes various State policies to assist agricultural processing.

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Why Aren't There More and Closer Value-Added Agriculture Facilities?

A farmer logically benefits from more and nearer agro-industry facilities since net farm income stands to gain from lower transportation costs and heightened competition among buyers. The farther away a farm is from an elevator or plant, the higher transport costs and the lower net farm revenues are. Field crops and livestock are called shipping goods because farmers are responsible for transporting them to the next stage (elevator, plant, etc.) in the marketing chain. The fewer the facilities, the higher the concentration is on the buyer side and the less bargaining power farmers may have.

Given the efficient size of the facility, agro-industry location depends on the tradeoffs between the benefits of being close to farms and the costs of being close to competitors, far from nonfarm inputs, or far from markets. Because most agro-industry products are also shipping goods, the farther away a facility is from transshipment points or retail markets, the lower is its net revenue. Some transport costs might be avoided by building many small plants. But this would mean higher fixed costs and lower returns to investment in the industry. Large-scale agro-industry establishments also need access to many farms, or a port, to reduce the risk or cost of an interruption in input supply from any one source. But costs may rise if there are many plants competing in local input and output markets and operating below the minimum efficient scale.

If a location has too few plants, a new plant may be profitable. Thus, there can be market incentives to expand agro-industry. But there may be problems in rural



Farmer harvesting corn. Photo courtesy Digital Stock.

areas, such as higher cost/lower access to capital, lower returns to rural entrepreneurial expertise, insufficient predictability or information with respect to distant markets, and environmental or zoning restrictions.

State Policies and Programs

States address the problems of access to capital, entrepreneurial expertise, marketing, and legal restrictions with a variety of programs targeting value-added agriculture.

Through data on State budgets and legislation, along with telephone and mail communications with State government personnel, we documented over \$280 million budgeted for value-added agriculture across the 50 States in 1998-99. Every State offers at least one value-added agriculture program (table 1).

State labeling and State-grown product promotion programs address the market information problems that may undermine the expected profitability of value-added agriculture. All but two States (Arkansas, Louisiana) promote and/or certify State products. Some

States (e.g., Georgia, Kentucky) also facilitate branding by providing applications for certification online. Connecticut, Hawaii, Kentucky, Montana, New Jersey, North Dakota, Oregon, and Washington have three or more labeling, marketing, and promotion programs.

Thirty-seven States subsidize loans or offer loan guarantee programs, grants, tax abatements, or other financial incentives to businesses that process agricultural products (fig. 1). All financial assistance programs are coupled with

Table 1

Types of State value-added agriculture programs, 1998-99

Promotion and State labeling are the most popular State value-added agriculture programs

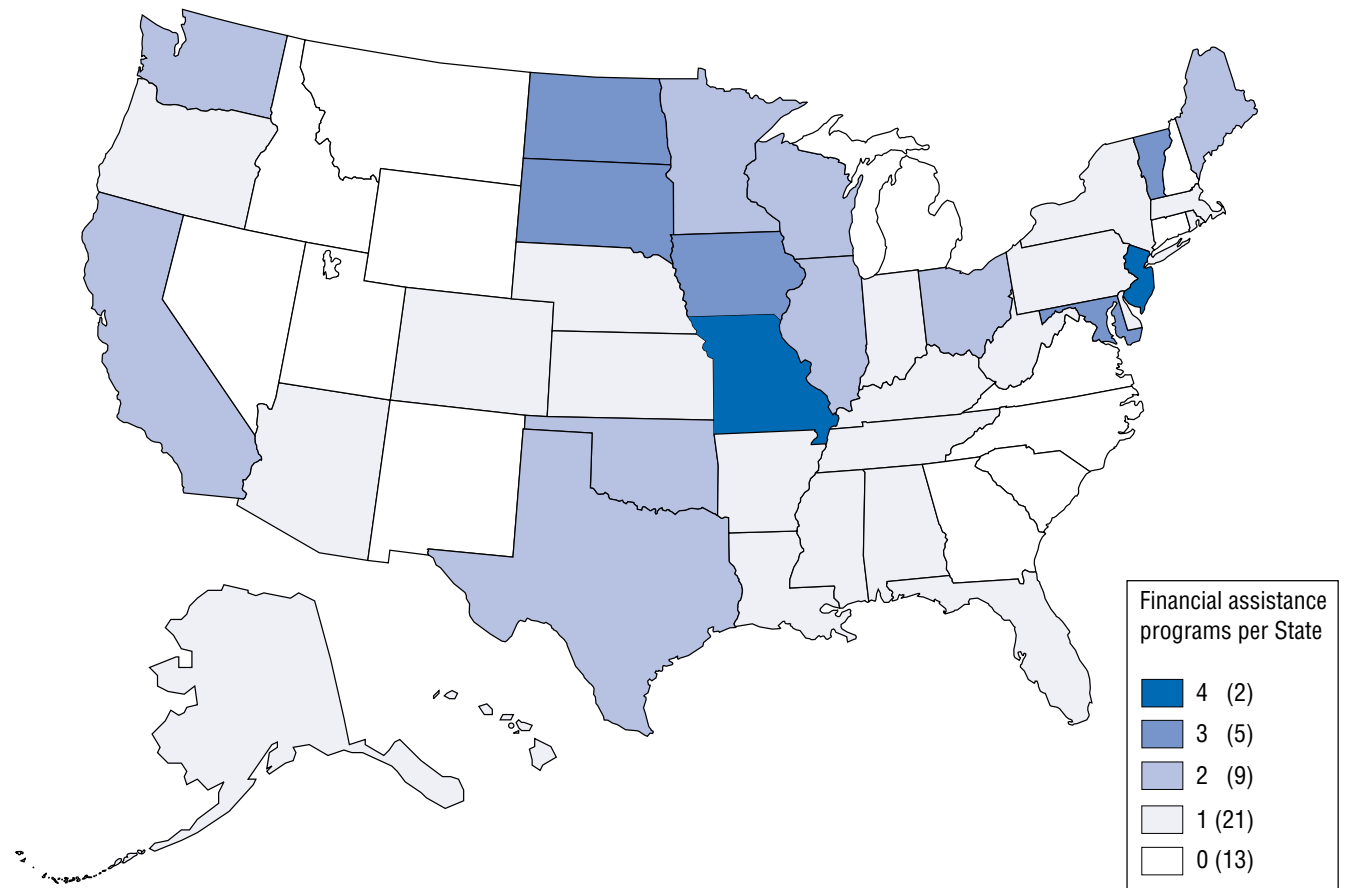
Promotion and State labeling	96
Business and technical assistance	77
Loans (35) and grants (27)	62
Directories	35
Market research	27
Jobs and training	4
Legal issues	3
Total	304

Source: State Internet sites and personal communication with State government agency personnel.

Figure 1

Financial assistance programs

Thirty-seven States offer various forms of financial assistance to value-added agriculture firms



Source: State Internet sites and State government agencies.

business planning technical assistance. These programs address the twin problems of insufficient financial expertise and financial capital. By reducing the costs to lenders of making loans, the State shares in the risks of financing new value-added agricultural activities, which are intended to benefit more than just the principals involved.

States expect effective programs to expand demand for local farm output, to capture for farmers a larger share of consumers' willingness to pay for higher quality, to help countervail market power on the nonfarm industry

side, and to increase rural nonfarm employment opportunities. The sponsoring legislation purports to "strengthen the economic viability of production agriculture and agribusiness" (New York), "increase sales of [our State's] agricultural products" (Texas), "increase competitiveness" (Michigan), and "aid the economies of rural communities" (Missouri).

State support for value-added agriculture has a long history (fig. 2). Western States appear to have been the early birds. The first reported program began in North Dakota in 1919 when the Bank of

North Dakota provided financial assistance to start up agricultural processing firms. Oregon, Arkansas, and Hawaii also initiated programs before 1970. Most States initiated programs after 1984.

States use bond financing (e.g., Maryland, Maine, Rhode Island) and revenues from State income and sales taxes (e.g., North Dakota, Texas, Wisconsin), user taxes (Iowa), license fees (Kentucky), and even severance taxes (Arkansas, Wyoming) to finance the programs.

State departments of agriculture are typically responsible for product promotion programs and

trade directory projects. Ethanol programs are also under departments of agriculture. Loan and/or grant programs are the responsibilities of the State treasurer, departments of economic development or commerce, or State development finance authorities, often jointly with the State department of agriculture. State university and extension systems are responsible for most production technical assistance and market research programs.

There is no evidence that States with relatively higher farm employment offer more programs. Some States with many farmers offer few programs, and vice versa. But there is a clear relationship between the types of production agriculture in a State and the types of programs offered. For example, States bordering major rivers and coasts often offer aquaculture programs, while Corn Belt States have ethanol programs (fig. 3).

Value-Added Agriculture: Rural or Urban?

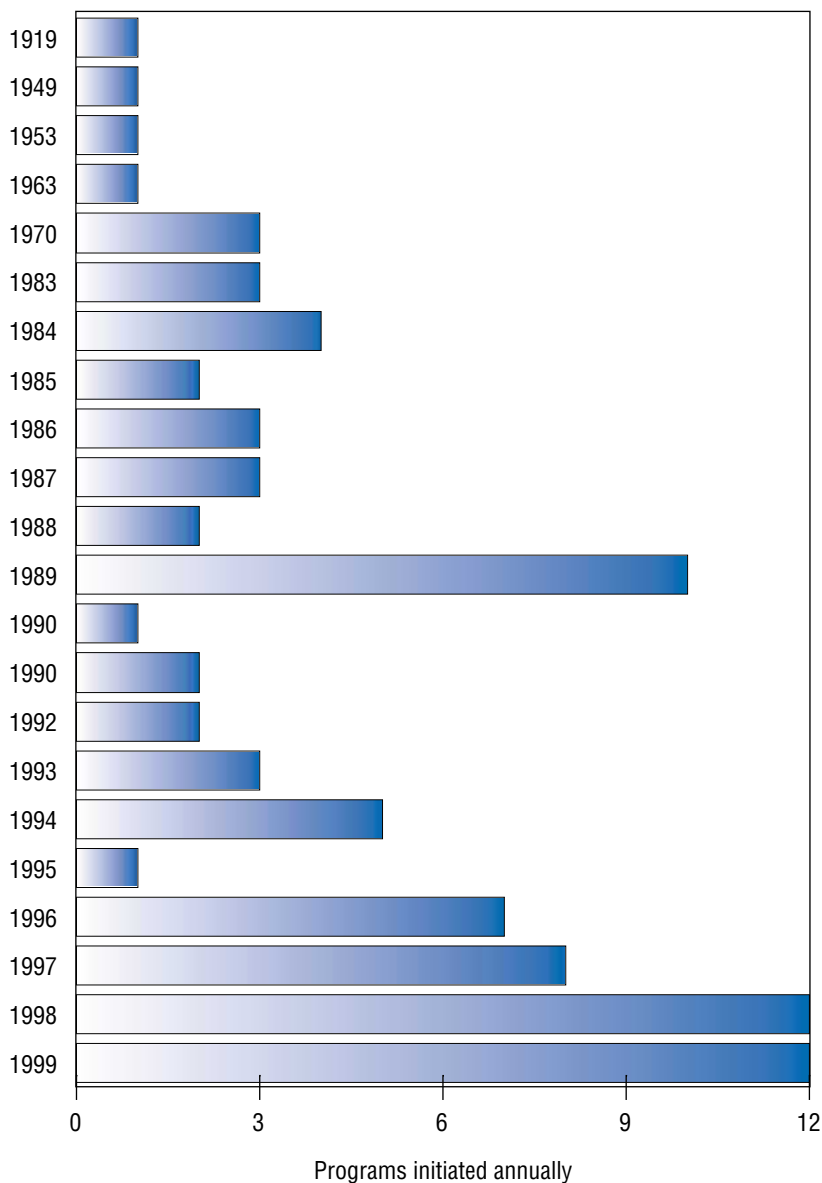
Though some States emphasize rural development as the objective (Iowa, Illinois, Michigan, Missouri, Oregon, California, Colorado, Vermont, Massachusetts, Pennsylvania, New Jersey, Maryland, Delaware), having more agro-industry facilities does not necessarily lead to more rural income or employment. The effect on non-farm rural income and employment depends on whether the value-added agricultural firms locate in rural areas and whether owners and employees reside in rural areas.

Attempting to capture more agro-industry value-added in rural areas, three-fifths of sponsoring States specify rural applicants.

Figure 2

State programs for value-added agriculture, number created annually, 1919-99

New programs have appeared each year since 1983

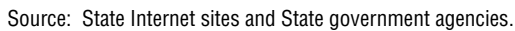


Source: State Internet sites and State government agencies.

Missouri and Delaware, for example, require that recipient businesses be rural. Other States (e.g., Missouri, Illinois) give preference to small businesses. Targeting support to small businesses may be the

most effective way to support rural development for two reasons. One, more of the locally owned small business income may stay within the local area. Two, small businesses are the better fit for rural areas.

Location influences the type of State program offered



establishments (97 percent) and jobs are in metro or urban counties ("Metro" as used here are counties classified 0,1,2,3 by rural-urban continuum codes; partially urban nonmetro counties are counties classified 4,5,6,7; rural counties are classified 8,9). Urban enterprises employ urban residents and some commuters from rural areas. In some sectors, such as cereals, pickles, and grain milling, all the large firms that employ 250 employees or more workers are in metro counties.

Firm Size Affects Optimal Location

Large agro-industry businesses need to locate centrally to many farms in a large production area. Many types also need to be near packaging, related support businesses, and diverse power and water supplies. The places that are most central or accessible to many farms are, however, cities. For example, Chicago, IL, Cedar Rapids, IA, and Bakersfield, CA, are cities built on value-added agriculture. They are optimal transshipment locations. They have historically been, and still are, most accessible to large supply regions. This is also why agrifood-related support busi-

nesses also tend to be in cities. A large business is also more flexible and can adapt at lower cost when it can draw on a large and diverse labor pool.

Thus, while it is historically a chicken-egg issue, large value-added agro-industrial firms are likely to be in cities because they are input-oriented. An industry is input-oriented when the costs of shipping inputs per unit of output exceed the costs of shipping outputs. The profit-maximizing location for this type of firm is the one that minimizes transport costs for inputs. This leads many people to assume that value-added agro-

industry optimally locates in rural areas. In fact, as discussed above, large value-added agro-industry optimally locates in cities that are central to the farm supply areas and in which labor and related input industries are relatively abundant. Consequently, the positive correlation between large value-added agro-industry firm density and population density is highly statistically significant.

Small value-added enterprises are more dispersed. Almost two-thirds of all food and kindred products processing firms are small (employ fewer than 10 people). A small business that processes raw agricultural products can be profitably located near a farm in a rural area. Alternatively, small firms that supply innovative products to specific clients (for example, organic or niche foods) may need to be close to their urban market. Thus, small agrifood firms are found everywhere: near farms and near markets—rural, urban, or metro.

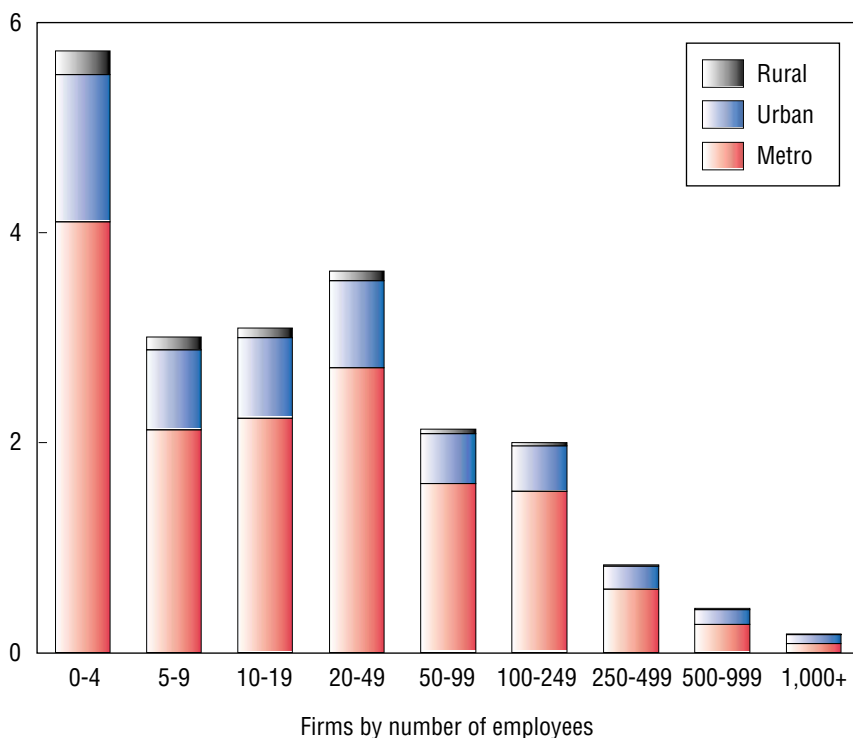
Two policy implications follow from this. One, if the objective is rural development, targeting support to new or small (fewer than 10 employees) businesses makes sense since rural businesses are more likely to be small. Two, if the objective is to significantly increase local demand for local farm output, urban or metro firms should not be excluded from eligibility. Public spending may be most effective if it leverages the opening of more large-scale plants in cities, because that is where those plants will be the most viable in the long run. In many sectors, a rural location would not be economically viable for large-scale plants. Even urban plants may provide opportunities

Figure 4

Distribution of food and kindred products processing establishments by location and employment, 1997

Only 3 percent of firms in the sector are rural and few have more than 100 employees

Number of establishments
(Thousands)



Source: County Business Patterns, 1997, Bureau of Economic Analysis, U.S. Department of Commerce.

for some rural residents who can commute to these jobs, while increasing demand for local farm output and heightening buyer competition.

Conclusions

Although farmers typically want more and closer agro-industry facilities, there are countervailing market incentives for private industry. State policies to promote facilities closer to farmers are likely to be effective only if there are problems with local capital markets, barriers to competition, labor immobilities and rural unemployment, or information constraints.

The effect of support for agro-industry on rural income depends on its impact on new agribusiness location, productivity, rural unemployment, and whether owners and employees are in rural areas or not.

Rural areas are best suited for small-scale agro-industry. Large agro-industry firms are generally more viable in locations that offer the most access to supply and markets and infrastructure. These locations are rarely rural; they are densely populated areas that provide labor and often house related industries, either suppliers or customers.

Thus, different tools are needed to meet different objectives. If the objective is rural development, support targeted to existing or new small businesses is likely to be more effective than support for new large firms. For local earnings to rise, the programs must either expand the employment of underemployed local residents, or increase firm productivity so that wages can grow. This also suggests targeting labor-surplus regions. If

the policy objective is to increase local demand for local farm output, support for urban or metro agro-industry firms is likely to be more effective since large firms near or in cities are the most economically viable. This policy may also increase the opportunities for a few rural residents who can commute to urban jobs, while it increases demand for local farm output, competition, and urban job opportunities.

Increased consumer demand for new and more desirable products will stimulate agro-industry activity. Some policies stipulate that grants be used to develop new uses for agricultural products, and/or to conduct market research. States also appear to realize that product promotion is an essential complement for the success of production-expansion programs. **RA**

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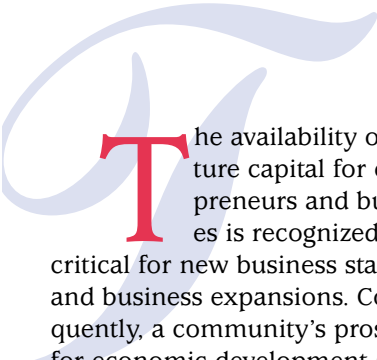
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Nontraditional Sources of Venture Capital for Rural America

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The availability of venture capital for entrepreneurs and businesses is recognized as critical for new business startups and business expansions. Consequently, a community's prospects for economic development are linked to local businesses' access to venture capital (Florida and Smith). However, the supply of venture capital is concentrated geographically, and venture capital investments are focused in a small number of regions and industries. According to the 2000 PriceWaterhouseCoopers survey, 71 percent of U.S. venture capital investments were in five States (California, Colorado, Massachusetts, New York, and Texas), and 91 percent of the investments were in technology and Internet-related companies.

The industrial and geographic focus of venture capital investments has contributed to the perception that geographically isolated and/or sparsely populated regions of the country and traditional, non-

Three types of nontraditional venture capital institutions are investigated: publicly funded and publicly managed, publicly funded and privately managed, and community-level equity funds. Each type has distinct advantages and disadvantages depending on program goals, funding sources, existing venture capital infrastructure, target industries and areas, and political environment. Successful nontraditional institutions tend to have skilled and experienced management, allocate resources to finding or generating investment opportunities, give significant attention to the fund's profitability, and enjoy insulation from political pressure or interference.

high-tech industries are underserved by traditional venture capital firms. "Small market" areas such as nonmetro communities and rural

"An important key to the success of local small and large businesses . . . is access to equity capital"
(Alan Greenspan, 1999)

areas are especially overlooked by traditional venture capital firms because of the relatively high cost of finding or creating deals and managing the investments (Markley et al.). In response to this perception of a venture capital shortage in small market areas, many States and communities have developed nontraditional sources of equity capital for local entrepreneurs and businesses.

This article summarizes the experiences of three types of nontraditional venture capital programs serving small market areas: public venture capital funds; publicly assisted, privately managed venture capital funds; and community-level equity funds. The more successful nontraditional venture capital programs (both in promoting business development and providing an acceptable return on investors' capital) were characterized by professional management, an incentive system that rewarded management for fund growth, adequate investment opportunities in the service area (i.e., deal flow), insulation from political interference, adequate resources for investigating potential investments (i.e., due diligence), and a focus on internal rate of return. The lessons learned from successful and unsuccessful programs will enable nonmetro areas to better assess their potential for operating a nontraditional venture capital program and the preferred organizational model for their situation.

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Street scene, Salem, New Jersey. Photo courtesy Jack Harrison.

Impediments to Traditional Venture Capital in Small Market Areas

Most traditional venture capital funds, according to Sahlman, are organized as limited partnerships with a predetermined life, usually 10 years. Capitalization of the fund is provided by the limited partners and the venture capitalist acts as general or managing partner. The fund invests in portfolio companies in the first 1 to 3 years, targeting investments with an expected return of at least 30 percent a year. Proceeds from the investments are harvested in the later years of the partnership and distributed to the limited partners. The managing partners receive an annual management fee (generally 2-3 percent of fund capital) and a predetermined percentage (e.g., 20 percent) of the total profit or earned interest on the fund's investments. The funding provided for initial capitalization and the remaining share of total profits (e.g., 80 percent) from the partnership are returned to the limited partners.

Nonmetro areas are rarely targeted by traditional venture capital investments because of four characteristics of these areas.

- Rural businesses are relatively small and concentrated in low-tech, low-growth sectors. Such businesses generally do not provide investment opportunities of the size and anticipated rate of return favored by traditional venture capital firms. In addition, the smaller size of rural investments results in higher fund management costs, for a given fund size, thus further reducing the net returns from investments.
- Rural entrepreneurs and business owners are reluctant to give up ownership in their businesses in exchange for equity capital. Many rural businesses are family owned and managed with the goal of transferring ownership to the next generation, not selling to a third party. Thus, alternatives for selling or liquidating investments (exiting deals) in small market areas may be more limited than in traditional venture capital markets.
- The cost of making and managing a venture capital investment is often higher in small market areas. The limited and dispersed investment opportunities or deal flow in nonmetro areas result in higher costs for identifying or creating deals and higher time and transportation costs for conducting due diligence and monitoring the investments.
- Rural communities offer relatively limited business infrastructure and human capital to meet the management needs of new companies. Venture capital firms investing in rural firms may have the additional expense of acquiring business services and managerial and technical personnel from outside the community.

The disadvantages associated with venture capital investments in small market areas have encouraged States and communities to investigate nontraditional sources of venture capital. Nontraditional venture capital institutions differ from traditional venture capital limited partnerships primarily in terms of the institution's goals and/or sources of capitalization. Nontraditional institutions typically are initiated to promote regional economic development and/or address perceived inefficiencies in the local venture capital market. Funding sources for nontraditional institutions are public and private organizations and individuals—such as State and local governments, banks, nonprofit foundations, utilities, landowners, and business people—that have an interest in the economic development of the region. These investors are more willing to accept a lower rate of return (relative to the target return for traditional venture capital funds) because of the potential for spillover benefits in terms of new tax revenues, increased demand for

local real estate, or new markets for local goods and services.

Case Studies of Nontraditional Sources of Venture Capital

Insights into the funding, organization, and operation of nontraditional sources of venture capital are provided through case studies of 21 venture capital institutions or programs (see box “Conducting the Case Studies”). This article focuses on the 11 venture capital programs categorized as either publicly funded, publicly managed funds; publicly funded, privately managed funds; or community-level equity funds (see “Site Visit Venture Capital Institutions, by Category”). These program types provide excellent examples of nontraditional institutions locating in nonmetro areas or making investments in nonmetro businesses.

Publicly Funded, Publicly Managed Venture Capital Funds

Three venture capital programs typify public funds serving small market areas: Minnesota Techno-

logy Corporation Investment Fund (MTCIF/MIN-Corp); Iowa Product Development Corporation (IPDC)/Iowa Seed Capital Corporation (ISCC); and Small Enterprise Growth Fund of Maine (SEGF). The three programs were established as non-profit corporations with management provided by employees of existing State agencies or quasi-public organizations (Minnesota Technology, Inc. for MTCIF; Iowa Department of Economic Development for IPDC; and Finance Authority of Maine for SEGF). For each program, oversight and investment decisions were provided by a board of directors appointed by the Governor. In the case of SEGF, the volunteer board is also responsible for due diligence on prospective investments. (Due diligence by venture capital institutions refers to indepth evaluations of prospective firms’ management expertise and qualifications, product market competition and opportunities, and growth prospects for sales and profits.)

Publicly funded, publicly managed venture capital programs generally are capitalized through State appropriations or bond sales. The MTCIF was capitalized in 1991 with \$7 million from Minnesota Technology, Inc., a State-sponsored program. SEGF was capitalized in 1997 through a State bond issue of \$5 million, and the IPDC/ISCC received annual appropriations from 1983 to 1996 totaling \$13.5 million. Public funding for these programs came with the restriction that the programs’ investments must be in businesses located in the State or in companies with a significant instate presence. In the case of MTCIF, 80 percent of the program’s investments must be in nonmetro counties. Restrictions on the location and type of venture capital investments reflect the programs’ goals of promoting State economic development, subject to maintaining the fiscal integrity of the funds.

The three public venture capital funds have been aggressive in pursuing investment opportunities in their respective States. The IPDC/ISCC invested in over 70 Iowa businesses, MTCIF invested in 16 Minnesota companies, and the SEGF funded or committed funding to 13 Maine businesses. In addition, the MTCIF and SEGF leveraged their investment activity in State businesses through requirements that their portfolio companies obtain matching funding from private sources of venture capital.

Public funding and management imposed limitations on the operations of IPDC, MTCIF, and SEGF, and the three programs evolved over time to address these concerns. For example, the housing of IPDC in the Iowa Department of Economic Development precluded the hiring of a professional venture

Conducting the Case Studies

Site visits to the selected institutions were conducted during 1998 and 1999. Visits generally included interviews with current program directors/managers, founders or champions of the program, and, when possible, owners of two or three of the program’s portfolio companies. Information collected included history of the program, sources and uses of funds, program organization and operations, characteristics of investment portfolio, status of portfolio companies, constraints/concerns with current operations, and goals or directions for future operations. The institutions selected for site visits were not chosen in an attempt to document “best practices;” indeed, three of the programs are no longer active. Instead, the objective of this analysis was to better appreciate the advantages and shortcomings associated with the alternative program structures.

Indepth case studies of the institutions will be available in 2001 on the Rural Policy Research Institution (RUPRI) web site (www.rupri.org). In addition, analysis of Small Business Investment Companies and community development venture funds is provided in recent publications by the Kansas City Federal Reserve Bank (1999) and on the RUPRI web site.

capitalist due to adherence to State payroll guidelines. In 1994, IPDC was restructured as a private, non-profit corporation (Iowa Seed Capital Corporation). ISCC staff now included a professional manager, investment decisions became more insulated from State politics, and the financial performance of the fund improved. MTCIF was also reorganized as an independent nonprofit organization (MIN-Corp) in order to more readily raise additional capital for their investment fund. MTCIF's management believed that its public connection

These public/private funds usually were started as a way of increasing the supply of professionally managed venture capital in the region, and/or enhancing the venture capital infrastructure and management capacity.

(and resulting perception of potential political interference) did not readily permit fundraising from the private sector and foundations. Finally, SEGF is investigating a change in structure from a publicly funded, publicly managed program to a publicly funded, privately managed fund. This change in ownership structure is viewed as a means of enhancing ability to leverage private funds and maintaining better due diligence and postinvestment services.

Publicly Funded, Privately Managed Venture Capital Funds

Six of the studied venture capital programs placed public monies

in privately managed venture capital funds. Each program required "matching" funds from private sources and, in three of the cases, inducements were provided to encourage private investments. These public/private funds usually were started as a way of increasing the supply of professionally managed venture capital in the region, and/or enhancing the venture capital infrastructure and management capacity. The goal of public/private funds generally was to maximize profit or internal rate of return (IRR) from the fund's investments; social objectives (e.g., increasing employment and income) were not as prominent as in public venture capital programs. In public/private venture capital programs, the State sacrifices control over investment decisions (and social objectives) in return for the more limited financial risk associated with private, professionally managed funds.

Capitalization of the public/private funds differed among the six case study programs. Kansas Venture Capital, Inc. (KVCI) was capitalized in 1986/87 with \$6.5 million from banks with headquarters or offices in Kansas and \$5.0 million from the State. The 350 or so banks that invested in KVCI were provided tax credits of 25 percent against the State privilege (banking) tax. The Iowa Capital Corporation (1991) was funded with a State appropriation of \$2.65 million that was matched (two-for-one match required) with subscriptions of \$5.3 million from two Iowa electric cooperatives. As an incentive to co-invest, the electric cooperatives were to receive their original investment plus an annual return of 9 to 15 percent on their investment before the State would receive any return on its investment. The Colorado Rural Seed Fund (CRSF)

was started in 1990 with \$250,000 from the Colorado Housing Authority, \$150,000 from the managing partner, and \$100,000 from private investors. The State of Colorado did not require a return on its investment, so private investors could receive significant leverage on their investments. Two of the public/private programs (Magnolia Venture Capital Fund (Mississippi), Northern Rockies Venture Fund (Montana)) required partial private funding for capitalization. However, no special incentives were offered by the States as inducements for private investors. Finally, the Oklahoma Capital Investment Board (OCIB) required no direct public funding, but the State made available a pool of tax credits that could be sold, if needed, to pay back borrowed funds. Thus, the tax credits provided by the State serve as collateral on OCIB's borrowed funds. (To date, OCIB has not drawn on the available State tax credits.)

Four principal organizational structures were used by the six programs studied. Magnolia, Northern Rockies, and Colorado Rural Seed Fund were established as limited partnerships, with the State as a limited partner in each fund. KVCI is a for-profit corporation and Small Business Investment Company (SBIC). The Iowa Capital Corporation also was established as a for-profit corporation, but is considering changing to a limited partnership as a means to attract additional private capitalization. Finally, the Oklahoma Capital Investment Board (OCIB) is a State-beneficiary public trust that functions as a \$50-million "fund of funds" for private venture capital limited partnerships. OCIB seeks to invest \$1 million to \$5 million in each limited partnership and maintain a maxi-

Site Visit Venture Capital Institutions, by Category

A. Publicly funded, publicly managed funds

Small Enterprise Growth Fund (Augusta, ME)
Minnesota Technology Corporation Investment Fund/MIN-Corp (Minneapolis, MN)
Iowa Product Development Corporation/Iowa Seed Capital Corporation (Des Moines, IA)

B Publicly funded, privately managed funds

Iowa Capital Corporation (Des Moines, IA)
Colorado Rural Seed Fund (Boulder, CO)
Northern Rockies Venture Fund (Butte, MT)
Oklahoma Capital Investment Board (Oklahoma City, OK)
Magnolia Venture Capital Fund (Jackson, MS)
Kansas Venture Capital, Inc. (Overland Park, KS)

C. Community-level equity funds

Ames Seed Capital Fund, Inc. (Ames, IA)
Siouxland Ventures, Inc. (Sioux City, IA)
McAlester Investment Group (McAlester, OK)

D. Certified capital companies (CAPCOs)

Louisiana CAPCO Program (Baton Rouge, LA)
Missouri CAPCO Program (Jefferson City, MO)

E. Community development venture funds

Coastal Ventures (Portland, ME)
Kentucky Highlands Investment Corporation (London, KY)
Cascadia (Seattle, WA)
Northeast Ventures (Duluth, MN)

F. Small business investment companies (SBICs)

First United Ventures (Durant, OK)
North Dakota SBIC (Fargo, ND)
Pacesetter and MESBIC Venture Funds (Dallas, TX)

mum 20-percent share in each fund. OCIB believes that a \$1-million to \$5-million investment will encourage the funds to seek Oklahoma deals, but the 20-percent maximum share ensures that State politicians will have little leverage on the funds' investment decisions.

Public funding for the public/private programs generally came with restrictions on the location and activity of prospective portfolio companies. Investments were restricted to instate business, or—for KVCI, ICC, Magnolia, and CRSF—businesses with a significant

instate presence. Montana required that 70 percent of NRVF's investments were with instate firms. The OCIB had no specific instate requirements, but private limited partnerships making little or no investments in Oklahoma firms were less likely to receive OCIB funding in the future.

The six publicly assisted, privately managed venture capital funds performed differently with respect to stimulating new businesses and providing the State a positive return on its investment. OCIB committed \$26 million to private funds, and these funds had drawn \$18 million and invested (including co-investments) \$66 million in 11 Oklahoma firms. OCIB claimed an internal rate of return on investments of 29.6 percent. KVCI made 26 investments in Kansas businesses and ICC invested in 15 Iowa companies. Return on investments made by ICC and KVCI were sufficient to permit the two programs to refund the State's contribution and restructure as private venture capital programs. NRVF had 6 investments by summer 1998, and anticipates 10 to 12 portfolio companies at the time it is fully invested. No deals were exited at the time of the site visit.

Alternatively, both CRSF and Magnolia must be considered failures in terms of economic development impacts and internal rate of return. The value of CRSF's investments had declined from \$500,000 in 1990 to \$100,000 in 1998. CRSF's lack of success demonstrates the problems associated with rural venture capital funds. The availability of investment opportunities (deal flow) was limited due to the area's principal economic base (tourism, agriculture, mining, business services) and an unwillingness by businesses to give

Advantages and Disadvantages of Nontraditional Venture Capital Programs

Advantages

Publicly funded, publicly managed

- Programs can be designed to meet policy objectives such as economic development or industry targeting
- Economic and social impacts are more likely to be considered in investment decisions

Publicly funded, privately managed

- Political pressure to make specific investments is diminished
- Program can offer the higher salaries and profit sharing necessary to attract experienced fund managers
- Private investors more willing to invest in privately managed funds, providing leverage for public capital
- Private venture capital funds more willing to co-invest with other private funds, increasing syndication opportunities
- Expertise generally is available to assist management of portfolio companies

Community-level equity fund

- Funds focus investments on specific location, increasing economic development impacts
- Investors in fund can supplement returns with indirect benefits (spillovers) from investments
- Funds can target areas overlooked by traditional and State-level venture capital funds

Disadvantages

Publicly funded, publicly managed

- Political pressure to make investments in specific communities or firms may exist
- Public programs find it is difficult to attract most talented fund managers
- Private venture capital firms are reluctant to co-invest with public funds
- Some State constitutions do not permit equity investments by State agencies

Publicly funded, privately managed

- Political pressure may be present in selecting private venture capital fund
- State economic development objectives may be undermined by focus on returns or concentration of investments in specific industries or stage of business development
- Economic performance of the fund may be limited by restrictions on geographic location or eligible businesses

Community-level equity fund

- Deal flow is limited to a relatively small geographic area
- Resources for conducting due diligence on investment prospects are constrained
- Inadequate fund size to provide diverse portfolio and follow-on investments

up ownership shares. Distance also was a problem as it was difficult and expensive to maintain close contact with portfolio companies. In addition, CRSF had difficulty in attracting management to rural Colorado to “turn around” companies in trouble. Finally, Magnolia Venture Capital Fund provides the classic example of potential problems with venture capital programs

if management is inadequate and the incentive systems do not reward fund growth. During its 2½-year history, MVCF incurred expenses of over \$4.5 million while approving only one investment of \$650,000. MVCF management was convicted of misappropriation of funds and the program was terminated in 1997.

Community-Level Equity Funds

Three of the nontraditional venture capital institutions in our study operated small investment funds focused on local businesses and entrepreneurs: Ames Seed Capital Fund, Inc. (ASCFI) of Ames, Iowa; Siouxland Ventures, Inc. (SVI) of Sioux City, Iowa; and McAlester Investment Group (MIG) of McAlester, Oklahoma. The three community-level programs were

organized as for-profit corporations. ASCFI was established in 1986 by the Ames Economic Development Commission, a nonprofit organization of the local chamber of commerce. ASCFI maintains four funds, ranging in size from \$300,000 to \$740,000, capitalized primarily by Ames residents and businesses. SVI was capitalized in 1991 with \$450,000 from 18 private investors and the Siouxland Initiative (an economic development program of the Siouxland Chamber of Commerce). MIG was formed in 1992 by 10 area businessmen who contributed \$20,000 to \$30,000 each for capitalization of the fund. MIG operates more like a formal network of angel investors than a corporation, and a consensus of shareholders is required before an investment is made.

Both ASCFI and MIG were started with the dual goals of providing an attractive rate of return for investors and stimulating local economic development. Investors in these two funds were willing to accept less than traditional venture capital rates of return because, as local business and property owners, they would benefit indirectly from new business activity in the areas. Alternatively, SVI's investment goal was to maximize returns on its investments, and economic development impacts were not criteria in their investment decision. However, SVI's investments were restricted to Sioux City, Iowa and surrounding areas.

Each community-level fund relied on part-time management, usually an employee of the local chamber and/or individuals selected from the fund's investors. These individuals lacked either the experience or the time for adequate due diligence, investment selections, or followup. In addition, the SVI board had many individuals representing

corporate investors (e.g., local banks, real estate firms, manufacturers), and these individuals lacked the incentives to be actively involved in management decisions.

The investment experiences of community-level funds is mixed. MIG successfully completed (exited) 2 investments and is credited with helping to create 1,400 area jobs. ASCFI's 4 funds made 18 investments: 5 successful exits, 4 write-offs, and 9 still active. However, the rate of return on ASCFI's early funds was below investors' expectations. SVI's investment portfolio, on the other hand, was not a financial success. SVI invested in five area businesses, three of which were write-offs, one break-even, and one still operating.

The community-level funds demonstrate the difficulty of dually pursuing an acceptable return for fund investors and promoting local economic development when deal flow is restricted to the local economy. ASCFI has established separate funds focusing on economic development and maximizing fund rate of return in order to enhance the financial performance of their venture funds. Community-level funds also struggle with procedures to ensure adequate due diligence on prospective deals. Due diligence might be supplemented by employing outside consultants or partnering with other venture capital funds on investments.

Lessons Learned

This study of nontraditional venture capital programs for small market areas did not find a "best" model. Each program alternative has distinct advantages and disadvantages (see "Advantages and Disadvantages of Nontraditional Venture Capital Programs"), and the most desirable program type for a particular situation will depend on

program goals, available funding sources, existing venture capital infrastructure, target industries, and political environment. For example, publicly funded, publicly managed venture capital institutions can be designed to achieve specific economic development goals, and lower returns on program investments can be justified if investments provide positive economic and social impacts. However, the public programs may experience difficulty in attracting experienced managers, may be subjected to political pressures, and may not be able to leverage public investments through partnering with private venture capital firms.

The community-level funds demonstrate the difficulty of dually pursuing an acceptable return for fund investors and promoting local economic development when deal flow is restricted to the local economy.

Publicly funded, privately managed institutions address many of the shortcomings of the publicly funded and managed programs. Private management of public venture funds generally provides better insulation from political interference in fund investments, a salary and incentive package attractive to experienced fund managers, and greater opportunities for attracting private capitalization or co-investments with private funds. The benefits of private management come at a cost. The privately managed fund, with its focus on specific industries and on maximizing the

fund's internal rate of return (IRR), is less likely to be concerned with specific State economic development objectives.

Finally, community-level funds provide an alternative for local economies that are bypassed by traditional and publicly assisted venture capital institutions. These community funds can provide significant local economic and social benefits. However, venture capital programs in small market areas generally have relatively high risks and low IRR as a result of limited deal flow and inadequate resources for fund management.

Conclusions

During the last 20 years, numerous nontraditional venture capital institutions were developed to assist entrepreneurs and businesses in regions and industries overlooked by traditional venture capital funds. The three types of nontraditional institutions addressed in this study offer distinct advantages and shortcomings with respect to program management, financial viability, and regional economic impacts. In addition, examples of successful and unsuccessful institutions were observed for all program types. The successful venture capital funds in small market areas generally shared six characteristics.

- Skilled and experienced management was hired and an incentive system installed to reward management for increasing the value of the fund.
- Program resources were allocated for generating deal flow via marketing or deal creation.

- Capitalization of the fund was optimal for providing a diverse portfolio and follow-on investments.
- Program management gave significant attention to fund IRR in order to maintain the longrun sustainability of the program.
- Program maintained a system for conducting rigorous due diligence on prospective investments.
- Potential for political pressure or interference in fund management was minimized.

In summary, the key to a successful nontraditional venture capital program is the management and administration of the program, not the selected structure. Moreover,

regardless of program type, successful nontraditional venture capital funds helped the local economy and demonstrated the potential for venture capital activity in the area. For example, Kansas Venture Capital, Inc. has invested in 30 companies, 6 of which are located in nonmetro counties, and has created or retained over 2,600 jobs. In addition, KVCi will repay the State of Kansas its original \$5 million investment in the fund. Thus, the economic development benefits from the publicly funded, privately managed institution are realized at little or no cost to the State. KVCi demonstrates that creating a successful nontraditional venture capital institution can be good public policy in "small market" areas such as nonmetro communities and rural areas. **RA**

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Socioeconomic Impacts of Agricultural Processing Plants

F. Larry Leistritz
Randall S. Sell



In recent years, many rural communities in the western Corn Belt and northern Great Plains have developed or attracted new agricultural processing facilities. This is generally seen as a positive development; cooperatively owned, value-added processing plants may allow farmers to share in profits from processing and marketing their products. Also, whether locally owned or part of a large, integrated agribusiness, new processing plants create jobs in rural areas hard hit by the 1980s farm crisis and subsequent farm consolidation. However, some host communities have found that the new plants offered more jobs than the local labor supply could fill and/or at wages lower than local workers would accept. An influx of newcomers, many with racial/ethnic backgrounds different from those of long-term community residents, has disrupted some communities. Local housing and public facilities may be strained by the

Expanded processing of agricultural products has been widely pursued as a strategy for rural economic development. However, the expansion of value-added agricultural processing in rural areas has not been without its problems. For example, some communities have found that new plants led to an influx of workers, many with racial/ethnic backgrounds different from those of long-term community residents. In interviews with community leaders and residents in four North Dakota communities with new processing plants, most felt the new plants led to improved job opportunities and enhanced incomes.

influx of workers. Additional demands for public services and expanded infrastructure may pressure fiscal resources. Further, the nature of some agricultural processing operations may raise air and/or water quality concerns.

In North Dakota, agricultural processing has been a cornerstone of economic development efforts since 1979, when the State established an Agricultural Products Utilization Commission (APUC) to promote value-added agricultural processing. APUC has assisted in predevelopment financing for a number of agricultural processing initiatives, and has funded numerous feasibility studies. During the 1990s, several new facilities were developed to process the region's agricultural products, including durum wheat, corn, potatoes, and bison.

North Dakota's agricultural processing initiatives were based on the hope of new job opportunities for area residents, improved incomes for farmers and other area residents (e.g., through improved

employment opportunities, opportunities to produce higher-value crops, and/or better prices/returns for existing crops), economic diversification for communities long dependent on production agriculture, population stability and reduced outmigration, improved local services (e.g., schools), and an enhanced tax base. This article examines several recently developed agricultural processing plants to determine how actual outcomes compared with initial hopes for nearby communities. The experiences of these communities are then compared with communities in other areas that have also seen agricultural processing expand.

Plants Process Agricultural Products of the Plains

Each of the four projects studied was the result of substantial development efforts over several years.

The Aviko USA plant is located just east of Jamestown (fig. 1). The plant, built in 1995-96 for \$70 million, processes about 4.6 million

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Table 1

Recently initiated North Dakota agricultural processing projects*New plants represent substantial investment and employment*

Project	Form of organization ¹	Date started		Initial investment	Operating employment		
		Construction	Operation		Initial ²	1998 ³	Current
		Year		\$ million	Number		
Aviko USA	IOF	1995	1996	70	160	220	260
Dakota Growers Pasta	C	1992	1993	43	100	275	275
North American Bison	C	1993	1994	1.6	20	46	50
ProGold	C	1995	1996	260	120	120	120

¹C = cooperative, IOF = investor-oriented firm.²Employment after 1 year of operation.³As of third quarter, 1998.

Source: North Dakota Agricultural Processing Survey.

hundredweight (cwt) of potatoes annually into frozen french fries and employs about 260 people. Aviko is one of the largest frozen potato processors in Europe.

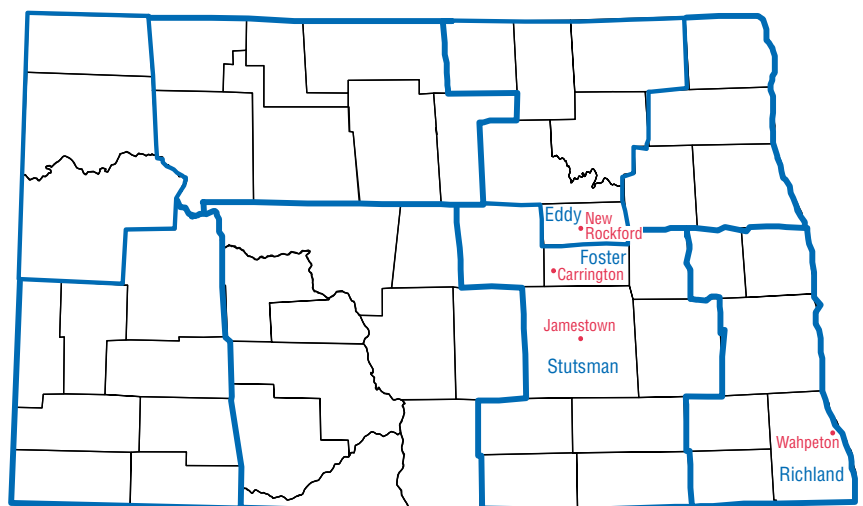
Dakota Growers Pasta, in Carrington (fig. 1), processes durum wheat into a variety of pasta products (e.g., spaghetti, macaroni, noodles). The plant is organized as a closed cooperative; in 1992, 1,040 durum growers purchased 3.1 million shares of equity stock at \$3.90 per share, raising more than \$12 million for the project. Each farmer received delivery rights to one bushel of durum wheat per share (i.e., they had both the right and the obligation to deliver the grain for processing annually). Plant construction began in 1992, and production began in 1993. In 1998, Dakota Growers had 1,084 durum growers as members, with about 96 percent North Dakotans and the remainder in Minnesota and Montana. Dakota Growers is now the third-largest producer of dry pasta in North America. The plant employs about 275 workers (table 1).

The North American Bison Cooperative (NABC) was formed in 1993 by a group of bison ranchers to build and operate a modern, efficient processing plant; 182 bison growers purchased equity shares at \$250 per share (one share = one bison delivered annually). Construction of the \$1.6 million plant began later in 1993 and was completed in 1994. The plant, located

just south of New Rockford (fig. 1), initially employed 20 workers. Plant capacity was expanded in 1996 and again in 1998; the cooperative currently employs about 50 workers and processes more than 10,000 bison annually.

The ProGold corn wet milling project was undertaken by farmers in the southern Red River Valley of North Dakota-Minnesota. In 1994,

Figure 1

Study Communities and Counties

more than 2,000 farmers subscribed to more than 15 million equity shares (each priced at \$3.35 and representing a commitment to deliver 1 bushel of corn annually) in the new cooperative, thus committing more than \$50 million of equity. The project was granted special tax concessions (extended local property tax abatements and State sales tax exemptions on equipment and machinery installed in the plant) by a special session of the North Dakota Legislature. Construction of the \$260 million facility began in 1995 on a site near Wahpeton (fig. 1) and was completed in the fall of 1996; at the peak of construction activity, about 1,200 workers were employed.

The plant produced its first commercial-quality high-fructose corn syrup (HFCS) in December 1996 and was fully operational early in 1997. While the project was completed on schedule and within budget, the plant had difficulty marketing its corn sweeteners because of overcapacity in the HFCS industry, and the grower co-op sustained a net loss of \$11.7 million in fiscal year 1997. To reduce losses and improve the likelihood of future dividends to members, ProGold management negotiated an agreement to lease the plant to Cargill, Inc., effective November 1997. Since the lease went into effect, the plant has been operating with stable employment—about 120 employees (table 1). The plant has the capacity to grind about 85,000 bushels of corn per day, producing corn sweeteners, corn-based feed ingredients, and corn germ.

Site Communities Had Suffered Economic and Population Decline

The site communities represent a cross-section of the nonmetro trade centers in eastern and central North Dakota. With 1998 populations ranging from 14,700 (Jamestown) to 1,500 (New Rockford), these towns have traditionally served as trade centers for areas whose principal industry is agriculture (table 2). All four communities experienced population declines during the 1980s, which can be largely attributed to that decade's farm crisis and ongoing farm consolidation. All four towns

suffered decreases in their inflation-adjusted taxable sales and purchases during the 1980s, ranging from 7 percent (Wahpeton) to 64 percent (New Rockford). Thus, these communities entered the 1990s with a dire need for economic revitalization.

Plants Stabilize Local Economy and Population

Leaders interviewed in each of the communities with new processing plants cited improved job opportunities and enhanced incomes as major positive effects. Aside from some management and

Table 2
Population and adjusted taxable sales for agricultural processing site communities, 1980 and 1990-98

Population and sales were stable or declining in site communities

Item	City			
	Carrington	Jamestown	New Rockford	Wahpeton
Population:				
	<i>Number</i>			
1980	2,641	16,280	1,791	9,064
1990	2,267	15,571	1,604	8,751
1996	2,163	14,983	1,525	9,039
1998	2,111	14,713	1,497	9,322
Change:				
	<i>Percent</i>			
1980-90	-14.2	-4.4	-10.4	-3.5
1990-98	-6.9	-5.5	-6.7	6.5
1996-98	-2.4	-1.8	-1.8	3.1
Adjusted taxable sales and purchases:				
	<i>Thousands of 1997 dollars</i>			
1980	39,751	174,720	17,217	72,789
1990	25,106	134,997	6,237	67,967
1996	31,075	150,950	6,270	79,732
1998	29,121	159,114	6,092	76,408
Change:				
	<i>Percent</i>			
1980-90	-36.8	-22.7	-63.8	-6.6
1990-98	16.0	17.9	-2.3	12.4
1996-98	-6.3	5.4	-2.8	-4.2

Source: Calculated by authors from Census Bureau and ND State Tax Department data.

engineering positions, most of the plant jobs went to area workers rather than immigrants. Residents' incomes were boosted both by the plants' payroll (which often represented second incomes for area households) and by increased incomes for area farmers. Dakota Growers Pasta, for example, was credited with adding \$1 per bushel (25 percent or more) to producers' returns.

In all communities, the additional job opportunities resulted in an increased demand for housing, increased occupancy of vacant units, and sometimes a perceived local housing shortage.

The new plants did not lead to substantial immigration or major population growth in the host communities because most of the plant jobs were taken by area residents. Plant workers who did move to the area were seen by local leaders as offsetting the long-term population decline and stabilizing the local economy. During 1996-98, three of the four site communities reverted to decreases in population, and three of the four showed declining retail sales, likely due to the depressed state of the region's agricultural economy overall.

The plants' effects on infrastructure and service needs were substantial for the two smaller communities (New Rockford and Carrington), but less so in Jamestown and Wahpeton, where the agricultural processing plant was among several expanding

employers. (Here it was sometimes difficult to separate the effects of the agricultural processing plant from the effects of growth in manufacturing sector employment generally.) In all communities, the additional job opportunities resulted in an increased demand for housing, increased occupancy of vacant units, and sometimes a perceived local housing shortage. (Some respondents commented on the apparent inconsistency between housing shortages and stable or declining local populations. A regional demographic trend toward smaller households has likely increased the number of households in these communities even though population has declined.) Affordable housing units (that plant workers paid \$9-\$13/hour can afford) were generally believed to be in shortest supply.

Day care—its affordability and the need for extended hours—was reported to be affected by plant development and/or manufacturing growth in each community. Affordability relates to the challenge of meeting Federal and State requirements while keeping rates at levels that plant workers can afford. Extended hours were a special concern with respect to major employers that operate around the clock; most daycare facilities have schedules geared to the standard workday. However, two of the communities had attempted to offer day care for shift workers and determined that numbers were insufficient to support the service.

Demands on public services were mixed. Streets and roads were somewhat affected, with three of the four sites reporting additional expenditures to improve access roads to the plant. Increased road use by trucks delivering products and/or by workers was reported,

but was generally not a serious concern. Fire and police protection were not seen as issues in most communities, although the 1,200 construction workers associated with the ProGold project led to some short-term policing issues. Those school-age children who came to the community served mainly to stabilize local enrollments during a period characterized by a declining school-age population across the State. Increased needs for special education services were reported by the two larger school districts, but respondents were not sure if this was due to a specific project, manufacturing growth in general, or societal changes. On the other hand, demands for social services had generally eased with the advent of plant-related job opportunities. In three of the four study communities, caseloads were reported to be down substantially over the past few years, and leaders credited improved job opportunities for the change.

Public expenditures and revenues were topics of interest for both leaders and residents of the affected communities. Each project had committed some public resources, generally provision of a plant site and some services, and each plant had received an abatement of local property taxes. The cost of providing services became a major issue only in Jamestown, where an expanded wastewater treatment facility ran over cost estimates and the city and company disagreed about the appropriate sharing of the costs. In Carrington and New Rockford, the resources committed were generally seen as appropriate in view of the plant's contribution to the community. In Wahpeton, the concern was not so much about the costs incurred but

Table 3

Community residents' assessment of positive effects of agricultural processing plants

North Dakota residents see jobs and income as plant benefits

	Community				
Attribute	Carrington	Jamestown	New Rockford	Wahpeton	Total
Percent who rated effect as positive or very positive					
Job opportunities	93.1	84.6	90.0	72.5	84.9*
Residents' incomes	61.8	51.3	61.2	43.7	54.4
Schools	59.8	30.8	29.5	25.2	35.3*
Quality of life	45.1	24.8	30.8	31.1	32.5
Local public revenues	38.2	37.6	32.6	16.7	31.0*

*Significant at the 1-percent level based on Chi Square test.
Source: North Dakota Agricultural Processing Survey.

that local benefits were less than anticipated, particularly in terms of population and retail sales growth.

The pros and cons of local tax abatements and other incentives were discussed in all the communities. A recurring theme was that these decisions should be based on an understanding of both short- and long-term implications for local government budgets, as well as the broader implications of having the facility in the community. School officials were sometimes apprehensive of tax abatement decisions that would affect their revenue base for years to come. On the other hand, county officials focused beyond the abatement period and cited the plant's long-term contribution to the local tax base. However, there was general agreement that local residents should be kept informed regarding the commitments being made to a project and the implications of those commitments.

Of all the plants' impacts, only air quality and water quality were rated more often as negative than positive by local residents. Objectionable odors were reported in connection with three of the four

plants, although local leaders generally considered these to be minor issues. Water requirements were a pre-development concern with

respect to two of the plants, while wastewater treatment became a major issue with one. These issues appear to have been resolved, but the inherent nature of some types of agricultural processing suggests that air and water quality are issues that need to be considered when such plants are proposed for development.

Residents Believe Plants Benefited Their Communities

Community residents were asked to rate the effects that the agricultural processing plant had on various aspects of their community (table 3). Almost 85 percent felt the effect on job opportunities was positive or very positive, ranging from 93 percent of Carrington (Dakota Growers Pasta) residents to

Table 4

Community residents' and leaders' assessment of positive and negative effects of agricultural processing plants

North Dakota leaders were more positive than residents about effects of agricultural processing plants

Attribute	Residents		Leaders	
	<i>Percent positive or very positive</i>		<i>Percent negative or very negative</i>	
Job opportunities	84.9	91.6	1.5	2.8
Residents' incomes	54.4	80.6	1.9	2.8
Schools	35.3	61.1	3.4	2.8
Quality of life	32.5	36.1	3.8	0.0
Local public revenues	31.0	77.8	14.5	11.1
Social organizations (churches, civic groups, etc.)	28.8	36.1	2.4	0.0
Child care/day care	28.1	42.8	5.2	2.9
Housing costs	26.7	50.0	20.3	19.4
Family life	23.8	25.0	3.0	0.0**
Local public expenditures	22.5	36.1	9.6	22.2*
Streets, roads, and highways	21.6	41.7	20.8	13.9
Fire protection	20.6	22.2	1.9	0.0
Police protection	16.0	22.2	3.4	0.0
Crime/public safety	9.6	5.6	8.6	8.3**
Air quality	6.8	8.3	24.0	19.5
Water quality	6.6	8.3	12.2	0.0

*Significant at the 1-percent level based on T test.

**Significant at the 10-percent level based on T test.

Source: North Dakota Agricultural Processing Survey.

73 percent of those in Wahpeton (ProGold corn wet milling). More than 54 percent felt that the plant development had a positive or very positive effect on community residents' incomes, ranging from 62 percent in Carrington to 44 percent in Wahpeton. Thirty percent or more of the residents cited schools (35 percent), quality of life (33 percent), and local public revenues (31 percent) as benefiting.

Among all residents, 24 percent felt that air quality had been negatively affected by the plants (table 4), followed by streets, roads, and highways at 21 percent, and housing costs at 20 percent. Of all the community aspects listed, only two (air quality and water quality) were more often rated as suffering than

benefiting from agricultural processing plants.

Leaders Were More Positive Than Residents About Plant Effects

Community leaders gave higher marks than residents regarding plant effects on most community aspects. In particular, almost 78 percent of leaders, compared with 31 percent of residents, believed that local public revenues had been positively or very positively affected (table 4). Similarly, 81 percent of leaders (54 percent of residents) felt that residents' incomes had benefited, and 61 percent of leaders (35 percent of residents) felt that local schools had gained. Concerning negative effects, leaders were less upset than residents over

water quality, but more concerned over the strain on local public expenditures.

Leaders may have rated the projects' effects more positively than residents because (1) leaders took a longer term view of some effects, and (2) leaders compared changes in their own communities with experiences of other rural communities around the State. For example, during interviews, several leaders commented on the major increase in the local property tax base that would occur as the tax abatements were phased out. Leaders also mentioned that, while their local school enrollments had been stable or declining slightly in recent years, similar communities without new plants had registered much greater declines.

Most community residents who expressed an opinion felt that the economic benefits of developing the agricultural processing facility in their community exceeded the costs (table 5). Approximately 47 percent of respondents overall indicated that economic benefits exceeded costs. Another 40 percent indicated they did not know if benefits exceeded costs; therefore, of those who expressed an opinion, 79 percent believed that economic benefits exceeded costs. Similarly, 34 percent of respondents overall (68 percent of those expressing an opinion) believed that the social benefits of plant development exceeded the social costs. If an election were held today, almost two-thirds of the residents agreed that most people in their community would vote in favor of the plant, and almost 72 percent would themselves vote in favor. The community leaders' responses to all of these questions were substantially more favorable to the plants than those of the residents (table 5).

Table 5

Community residents' and leaders' assessment of costs and benefits of agricultural processing plants

North Dakota leaders and residents agree that benefits exceed costs

Item	Residents	Leaders
Percent		
Economic benefits to community exceeded costs:*		
Yes	47.1	83.3
Don't know	40.1	8.3
No	12.8	8.4
Social benefits to community exceeded costs:*		
Yes	34.0	75.0
Don't know	49.8	16.7
No	16.2	9.3
If an election were held, most people would vote in favor of agricultural processing plant:		
Somewhat or strongly agree	65.4	77.8
If an election were held, I would vote in favor of agricultural processing plant:**		
Somewhat or strongly agree	71.8	91.4

*Significant at the 1-percent level based on T test.

**Significant at the 10-percent level based on T test.

Source: North Dakota Agricultural Processing Survey.

Outcomes Compared With Expectations

Comparing actual outcomes with expectations shows that most of the anticipated benefits were in fact realized. Improved job opportunities and enhanced incomes were generally seen as major positive effects of each of the new processing plants. Residents' incomes were seen as being enhanced both by the plants' jobs and payroll (which often represented second incomes for area households) and by increased incomes for area farmers—either from dividends paid directly by the processing plants (Dakota Growers, NABC), or from higher prices for a crop already being produced (ProGold), or by allowing producers to raise a commodity that previously had no viable market (Aviko, NABC). Because most of the plant jobs were taken by persons already living in the area, the new plants did not lead to substantial immigration or major population growth in the host communities, but rather served to stabilize the local economy and population (or to slow the rate of decline). Of all the effects of the plants, only air quality and water quality were more often rated as negative than positive by local residents.

Outcomes Compared With Other Studies

The recent literature regarding agricultural processing plants in rural areas is dominated by accounts of the shift in meatpacking plants from urban to rural areas in the Great Plains. These studies have emphasized a variety of social problems, including housing shortages, increases in crime, and increased demands for social assistance and special services. It is clear that the North Dakota com-

Methods

The research plan first required selection of processing plants and communities to be studied. The authors identified agricultural processing plants that had been developed during the 1990s in nonmetro counties of North Dakota. Four projects met these criteria and employed at least 40 workers as of the third quarter of 1998 (when selection decisions were made). In each of the site communities, the authors conducted indepth interviews with a cross-section of community leaders, with the aim of gaining an understanding of the community (i.e., its population, economic base, etc.), the effects of project development, other socioeconomic changes that might have either exacerbated or offset the project's effects, and the community's response to the situation. Representatives of each of the processing plants were also interviewed.

Subsequently, a short survey was completed by a random sample of residents in each community. The survey was administered using a dropoff and pickup procedure and focused on the residents' satisfaction with their community and the effects of processing plant construction and operation on the community. The survey resulted in 469 usable responses, for a response rate of 85 percent. In addition, the questionnaire was completed by 36 of the leaders who were interviewed (9 in each community), for a response rate of 75 percent.

munities studied here did not experience either the levels of immigration or the social problems reported in the other studies. Although the job openings of the North Dakota plants sometimes dwarfed the local labor pool (e.g., Dakota Growers' workforce of 275 represents 15 percent of Foster County's pre-project employment), most of the jobs were filled by area workers. Those workers who did relocate to the host communities were reported to be easily assimilated. While a thorough analysis of the reasons behind the differences in community effects is beyond the scope of this study, these differences appear to be substantial.

Lessons Learned

The community leaders interviewed over the course of this study were asked about their advice for other communities facing the prospect of a similar project.

Their advice fell into four major categories.

Appropriateness of Project and Compatibility with Community.

Leaders felt that the first consideration must be determining whether the project is economically feasible. In that regard, all four of the projects examined in this study had feasibility studies professionally prepared. Even so, the ProGold project faced serious problems stemming from unanticipated overcapacity in the HFCS market. The leaders also emphasized the importance of determining if the project is a "good fit" for the community in terms of infrastructure and labor force. This means that the leaders must have a thorough understanding of local capabilities (e.g., a local labor survey may be helpful to determine if the labor force will be sufficient to meet the firm's needs). In general, the community should ask how the company fits into the community's long-term plan.

Infrastructure Planning and Financing. Community leaders emphasized the importance of evaluating the costs of infrastructure improvements that might be required and, more generally, the short-term and long-term implications of the project and the incentive package that might be proposed. These issues need to be considered on a case-by-case basis. Also, in planning for infrastructure needs, the community should keep in mind that the effect of a project may be to offset a decline in other sectors, thus stabilizing the community rather than resulting in substantial growth.

Anticipating Issues and Needs. Examining experiences of other communities that had been sites of similar projects might help in identifying issues or needs that are likely to arise. Based on the experiences of the communities in this study, three issues are likely to arise with many agricultural processing projects: affordable housing, day care (especially for shift workers), and environmental (air and water) quality.

Development Approach and Attitude. Especially in the smaller towns, the leaders emphasized that attracting or developing a viable

industry is a major challenge, and that the alternative is to watch the community decline. Their advice was for rural communities to continue their development efforts and to recognize that the number of failures in these endeavors will always exceed the number of successes. They also suggested that communities should take a more regional approach to development, as the benefits of projects like those studied are regional in nature. Specifically, they felt that neighboring communities might consider pooling their resources to develop or attract a new plant. **RA**

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Regional Workforce Needs and Training

The Case of Northeast Minnesota/Northwest Wisconsin

Wayne Jesswein
Richard Lichty
Carolyn Zanko

More than ever before, firms considering a move or expansion are asking regions to prove they have a workforce available with necessary skills. Hard, workforce-related data are crucial to assist firms in making location decisions. This article summarizes surveys conducted in northeast Minnesota and northwest Wisconsin on workforce needs and availability. The purpose of these surveys was to provide local development, government, and planning officials with the information required to do their jobs.

Recent national reports and analyses point to a transformation in the U.S. economy. In the past, American workers with high school degrees could earn a middle class living by working hard in America's factories. High productivity resulted from assembly line techniques and the gains from specialization justified high wages. High-level skills were generally not required.

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National studies repeatedly point to workforce abilities, training, and education as major determinants of regional economic development potential. A survey in northeast Minnesota and northwest Wisconsin found that only 25 percent of the respondent firms experience trouble in this regard. Further, the skills required in this region are not particularly high-tech. In contrast to the results and recommendations in the national literature, very few firms reported using public or private education providers in their skill training activities. In fact, a 1998 survey of households in the same region showed a labor force that is overtrained relative to the existing firms' needs. These findings suggest that labor analyses should concentrate on regional delineations and needs.

Global competition, according to these national studies, is now forcing changes within American industries. The assembly line is now controlled by computers, and physical jobs requiring low-level skills are moving to other countries offering lower wages. The unskilled worker is being marginalized in low-paid occupations. High-order skills (e.g., technical and computer skills) are now required to earn a sufficient income.

American industry has responded, in part, by introducing high-performance work organization practices that require management to delegate more authority to worker-teams and that require higher skills of workers. High performance means the adoption of new technology and the hiring of skilled workers to implement these technologies. The availability of a qualified labor force has been a concern for some time. As the U.S. economy moves toward newer technology in the workplace, a

corresponding need for an increase in worker skills is creating worker shortages in many key industries, such as computer-based manufacturing and other computer-related enterprises.

Previous workforce literature articulates a consistent and positive relationship between economic development and workforce availability. Many authors emphasize that in today's technologically advanced and global economies, an educated workforce—both trained for jobs and adaptable to new technologies and workplace changes—is essential for keeping and attracting businesses. A region that can demonstrate that its workforce is motivated, skilled, and adaptable will have the upper hand in the competition for new industry.

With the cost of training employees rising, employers increasingly rely on public and private educational systems to help its workforce evolve. Some companies are taking a greater role in the edu-

Figure 1

Study area

The study area included the Port Cities of Duluth and Superior, the Rural Range counties of northeast Minnesota, plus Douglas County, Wisconsin.

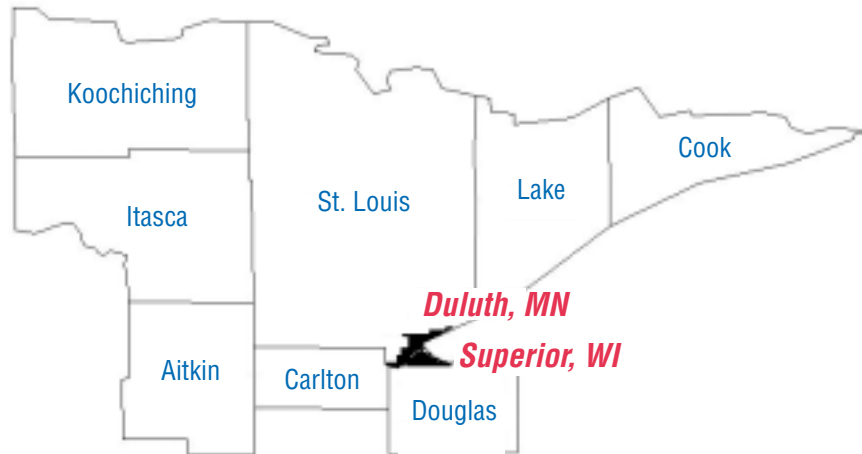


Table 1

General economic view of Northeast Minnesota and Northwest Wisconsin region

Northeast Minnesota and northwest Wisconsin covers counties that span 20,400 square miles

County	Population, 1999, est.	Employees, 1998	Total annual payroll, 1998
		<i>Number</i>	<i>\$1,000</i>
Rural Range:			
Northern St. Louis	87,733	46,638	1,317,690
Aitkin	14,293	2,887	53,852
Carlton	31,492	7,964	229,365
Cook	4,772	1,842	33,694
Itasca	44,154	13,334	321,916
Koochiching	14,895	4,949	118,498
Lake	10,765	3,002	70,725
Port Cities:			
Southern St. Louis	109,481	72,303	1,884,580
Douglas, WI	42,967	12,759	277,657

Source: U.S. Census Bureau

and northwest Wisconsin. This assessment was based on a survey of both regional firms and households. The firm survey offered the perspectives on skilled workforce issues from a sample of firms of all sizes. It determined the need for high-skilled/technical workers by firms in this region and assessed the reliance of these firms on the educational system to develop, educate, and train their workforce.

Northeast Minnesota and northwest Wisconsin (fig. 1) covers 8 counties that span over 20,400 square miles, with a population of 356,000 and a workforce of almost 150,000 (table 1). There are over 11,000 firms in the region, with employment and wages especially heavy in services, government, and retail (table 2).

Rural Range Versus Port Cities Firms

Duluth and Superior constitute portions of two counties, St. Louis in Minnesota and Douglas in Wisconsin. St. Louis County is quite large, beginning at the tip of Lake Superior and ending over 150 miles north at the Canadian border. Duluth and Superior are twin cities that represent the urban portion of the eight-county region. The remainder of the region contains relatively small cities, such as Hibbing, Grand Rapids, and Cloquet, all with populations of less than 25,000.

Most of the region outside the urban core depends on natural resources for its economic well-being. Iron ore mining, timber operations, pulp and paper plants, and transportation are the major industries in the rural area. Durable goods manufacturing, much of it related to the resource industries, is also seen in the rural part.

cation of the workforce by providing grants and scholarships for vocational training, making company managers available to teach classes, and getting involved in curriculum change.

The Firm Survey

During 1998, the University of Minnesota, Duluth's (UMD) Bureau of Business and Economic Research (BBER) conducted a workforce assessment in northeast Minnesota

Table 2

Annual employment, wages, and number of firms in northeast Minnesota and northwest Wisconsin, 1997

Services, retail trade, and governments account for two-thirds of jobs in the region

Industry	Firms	Annual employment	Total annual wages
		<i>Number</i>	<i>\$1,000</i>
Total - All industries	11,102	148,382	3,684,753
Agriculture, forestry, and fishing		614	10,113
Mining		6,098	297,547
Construction		5,861	197,065
Manufacturing		15,564	530,580
Transportation, communication, and utilities		7,555	259,755
Wholesale trade		5,284	162,823
Retail trade		31,870	405,066
Finance, insurance, and real estate (FIRE)		4,579	121,684
Services		41,080	861,984
Government		29,862	837,981

Source: Minnesota Department of Economic Security and Wisconsin Department of Workforce Development, Bureau of Workforce Information.

The urban area offers various services to tourists, transportation such as Great Lakes shipping and air, education, medical services, pulp and paper operations, and limited aircraft manufacturing and repair. The water transportation industry ships iron ore, western coal, and agricultural commodities across the Great Lakes and throughout the world.

Most of the rural and urban industries depend on natural resources, either directly through mining and timber operations or indirectly through shipping and secondary manufacturing. The region's population is falling, both in the rural areas and in the urban core. Both rural and urban economies have been relatively stagnant over the past several years, although unemployment has been quite low recently, as in the rest of the United States.

Overall, firms in both rural and urban counties are more similar in their workforce requirements than they are different, relying on relatively traditional skills. Where differences do exist, they are generally small.

Sampled firms in the Port Cities were more likely to have job openings for skilled and technical workers in 1998 than were Range firms (59 percent to 44 percent). However, the two areas were not significantly different in the share of firms indicating they had difficulty finding skilled workers (table 3). Approximately half (49 percent) of those who had skilled openings reported difficulty finding those workers—a quarter (24 percent) of all sampled firms.

For the Rural Range, the skills firms most frequently cited as difficult to find included (ranked by number of times mentioned) medical specialties (32), mechanical/

machinists (18), computer related (11), managers/supervisors (11), teachers (8), cooks (6), and engineers (6). Few firms listed the same skill or job as hard to find.

For the Port Cities, the more elusive skills included medical (16), service personnel (13), mechanical/machinists (11), financial (7), and computer related (7). Again, firms appear to have experienced shortages of different skills. Apart from medical and, to some extent, mechanical skills, most of the skills listed as difficult for firms to attract do not fit the image of highly technical or esoteric skills. In fact, based on a classification method used by the Minnesota Department of Economic Security, only about 9 percent of the occupations listed as difficult to fill by the respondent firms are in the high-tech category.

Skill training approaches.

About three-quarters (73 percent) of both Port Cities and Rural Range firms had on-the-job training, and most were somewhat or very satisfied with it (table 4). Satisfaction with this approach was significantly higher for Range firms than for Port Cities firms.

Nearly half of the firms (45 percent) provided other types of training. Retraining existing employees was more likely among Range firms (72 percent) than among Port Cities firms (50 percent); nearly all that used this approach were somewhat or very satisfied with it (98 percent). Over half of all firms provided formal job training for new employees (52 percent), with almost universal satisfaction (table 4). Fewer (45 percent) used tuition reimbursement of employee training expenses.

Very few firms reported using public or private school/provider training contracts. Seven percent used public sources, significantly

Table 3

Hiring and training a skilled workforce, winter 1998

Rural and urban counties were not significantly different in terms of the percent of firms indicating they had difficulty finding skilled workers

Item	Rural Range		Port Cities		Total		Statistical significance
	Percent (Number of firms)						
Had job openings for skilled/technical workers in past year	44	(201)	59	(111)	49	(312)	*
Had difficulty finding needed special/technical skills							
Among those firms that had skilled job openings in past year	53	(89)	42	(65)	49	(154)	ns
Among all firms surveyed	23	(201)	25	(111)	24	(312)	--

Note: Differences between areas that are marked "***" are statistically significant at the .05 level using either a chi square or an exact test (ns is used for not statistically significant at the .05 level).

Number in parentheses is the number of cases that is the base of the percentage. Numbers vary depending on item nonresponse.

Source: University of Minnesota, Duluth, Bureau of Business and Economic Research, 1999

more in the Port Cities (14 percent). Sixty percent using this approach were somewhat or very satisfied with it. Four percent of firms used private school/provider contracts and all of these indicated satisfaction with the approach.

Other skill training approaches were indicated by about a third of the firms in both areas and, among users, all indicated satisfaction. Again, differences are not statistically significant. Both areas listed seminars, apprenticeship or mentoring, safety training, and in-service training. Port Cities respondents listed computer training more than did Range respondents. Range respondents listed training by independent industry or association groups or manufacturers, which is not mentioned by Port Cities firms. Otherwise, the two lists do not include radically new approaches to skills training.

Job Openings and Training Differ by Firm Size

The sample size was sufficient to provide a comparison of responses broken down by size of firm. In approximate thirds, firms were divided into three size categories for firms in the northeast Minnesota/northwest Wisconsin area: small (1-25 employees), medium-sized (26-135 employees), and large firms (136 or more employees). Smaller firms are more likely to be in the Range area (66 percent) than are larger firms (29 percent).

Nearly half of the small firms (45 percent) had job openings for skilled or technical workers in the previous year, and this increases significantly as firm size grows (table 5). Three-quarters of medium-sized firms and 83 percent of large firms sought skilled workers in the previous year. Differences among firms in difficulty of finding skilled workers were not significant. Overall, 49 percent of firms had difficulty.

Skills listed as difficult to find.

Larger firms appear to have difficulty finding medical personnel. Small and medium-sized firms, but not larger firms, list cooks as hard to find. Administrative jobs appear to be listed more often by medium-sized than by smaller or larger firms. Less than 10 percent of the occupations listed by the respondent firms are high-tech occupations, according to a classification method used by the Minnesota Department of Economic Security.

Skill training approaches.

Medium-sized and smaller firms are more likely to use on-the-job training (84 and 73 percent) than are larger firms (61 percent). There are no significant differences by firm size in satisfaction with this approach (table 6). Among the approaches used that are significantly different by firm size is use of formal job training for new employees. The smaller and medium-sized firms are more likely to do this (50 percent and 65

percent) than are larger firms. Satisfaction with this approach also does not differ by firm size (table 6).

Larger firms are more likely to use approaches other than on-the-job training (83 percent). Twenty-six percent, versus just 4 percent of smaller firms, used public school or public provider training contracts. Satisfaction with this approach corresponded with use. Larger firms are also more likely to use private school or private provider training contracts, though satisfaction is not significantly different.

Firms of different sizes do not differ significantly in using tuition reimbursement. However, larger firms are less satisfied than smaller firms with this approach (table 6).

Some Household Survey Results

The household survey did not show much difference between rural workforce availability and availability in the Port Cities. Firms were looking for traditional (as opposed to high-tech) skills and households were offering traditional skills.

A stratified random sample of households provided information regarding the supply side of the market (Center for Economic Development, 1998b). Information was collected on an individual's willingness and ability to work, as well as job and work skills offered, satisfaction with current job, and possible underemployment.

About half of the respondents said they had some form of professional certificate or license. Fifty percent said they had more than one skill to offer employers.

Table 4

Type of workforce training used and satisfaction with the training, winter 1998

For the most part, regional differences are not statistically significant, except for satisfaction with on-the-job training differences, retraining of existing employees, public school/provider training, and tuition reimbursement satisfaction

Item	Rural Range		Port Cities		Total		Statistical significance
<i>Percent (Number of firms)</i>							
Types of training offered:							
On-the-job training	72	(201)	76	(111)	73	(312)	ns *
Percent somewhat or very satisfied	99	(144)	86	(81)	94	(225)	
Firms providing other types of training (total)	45	(201)	46	(112)	45	(313)	ns
Formal job training for new employees	52	(85)	52	(50)	52	(135)	ns
Percent somewhat or very satisfied	100	(44)	96	(26)	99	(70)	ns
Retraining of existing employees	72	(90)	50	(50)	64	(140)	*
Percent somewhat or very satisfied	100	(65)	92	(26)	98	(91)	ns
Public school/provider training contracts	3	(90)	14	(50)	7	(140)	*
Percent somewhat or very satisfied	67	(3)	57	(7)	60	(10)	ns
Private school/provider training contracts	3	(90)	6	(49)	4	(139)	ns
Percent somewhat or very satisfied	100	(3)	100	(3)	100	(6)	ns
Tuition reimbursement	44	(90)	45	(51)	45	(141)	ns
Percent somewhat or very satisfied	100	(39)	91	(23)	97	(62)	*
Other training for skilled workers	32	(90)	40	(50)	35	(140)	ns
Percent somewhat or very satisfied	100	(29)	100	(21)	100	(50)	ns

¹ Differences between regions that are marked *** are statistically significant at the .05 level using either a chi square or an exact test (ns is used for not statistically significant at the .05 level).

Source: University of Minnesota, Duluth, Bureau of Business and Economic Research, 1999.

Table 5

Hiring and training a skilled workforce, winter 1998

Less than half of the small firms had job openings for skilled or technical workers in the previous year versus 80 percent of larger firms

Item	Small (1-25)	Medium (26-135)	Larger (136+)	Statistical significance ¹
<i>Percent</i>				
Had job openings for skilled/ technical workers in previous year	45	78	83	*
Had difficulty finding needed special/technical skills				
Among firms who had skilled job openings	46	63	52	ns
Among all firms surveyed	21	49	43	—

¹ Differences between the three firm sizes that are marked “*” are statistically significant at the .05 level using either a chi square or an exact test (ns is used for not statistically significant at the .05 level).

Source: University of Minnesota Duluth, Bureau of Business and Economic Research, 1999.

Twenty-eight percent of the household respondents were engaged in training to enhance job skills, much of this at their own expense. Seventy-nine percent had completed 12 years of education. This compares with 75 percent nationally (according to the 1990 Census of Population). Fifteen percent of the study region's population had one or more college/associate degrees, compared with 20 percent nationwide.

Fifty-eight percent of those currently working were interested in switching jobs if an adequate alternative were available. A similar number said that their current skills were underutilized in their current employment, a sign of underemployment in the region.

The major difference between the Port Cities and the Rural Range was in a willingness to commute. The rural respondent was willing to commute greater distances for a suitable job than was the urban respondent. The wage levels in the two regions were comparable at an average wage of close to \$7 per hour. The willingness to work longer hours and at more jobs was also similar between the two regions.

Putting Regional Survey Information to Use

Information is the key to choosing and pursuing development options, and data related to workforce needs and labor availability are becoming increasingly important in industrial targeting.

Making such data available to developers and potential locating firms can be done in several ways. Regional data can be tailored to specific firm needs, or posted generically to the Web in this instance. In addition, members of the research team have been available for direct contact with potential locating firms and have made special statistical runs to meet their particular needs.

It is not clear to what extent the Minnesota/Wisconsin study actually resulted in attracting a firm. Many other factors go into such a decision. However, feedback from firm locating panels has been quite positive regarding the detail contained in the survey data offered.

The data can also be used as a baseline for forecasting future workforce needs in the region. Occupation forecasts are available from the Minnesota Department of Economic Security. However, these data are available only for multi-county regions. A future project will attempt to break the regionwide forecasts into county estimates.

The baseline from the surveys plus the eventual forecasts are useful in planning education and training needs for the region. With such information, community colleges, universities and high schools can better tailor their programs to regional workforce needs. The regional firm survey data show that few firms contract directly with local educational providers for their training needs. Better information may help to bring the local educational community and industries together for a better trained and more skilled workforce.

Conclusions

National studies have repeatedly pointed to workforce abilities, training, and education as major determinants of regional economic development potential. Generally

overlooked in these discussions is the need to document workforce needs and training in a particular region. Our attempt at determining workforce characteristics in north-east Minnesota and northwest

Wisconsin led to some surprising results.

While earlier studies warn of U.S. business firms' inability to find individuals with high-level skills, our analysis suggests the problem is not universal. Our survey in northeast Minnesota and northwest Wisconsin found that only 25 percent of the respondent firms experience trouble in this regard. Results were similar for both rural and urban counties. Further, the skills required in this region are not particularly high-tech. Also, in contrast to the results and recommendations in the national literature, very few firms reported using public or private education providers in their skill training activities.

The most obvious public policy implications of this analysis involve regional development efforts. Additional effort is needed to (1) better match regional skills to regional workforce needs, including education and training program development; (2) develop skills that can be used by prospective firms as regions attempt to diversify their economies; and (3) continuously update the regional workforce data bases so that future policies are based on the best current information available. **RA**

Table 6

Types of workforce training used

Firm size demonstrates significant differences in the type of training offered and the provider used

Types of training	Small firms (1-25)	Medium- size firms (26-135)	Larger firms (136+)	Statistical significance
	<i>Percent</i>			
On-the-job-training	73	84	61	*
Percent somewhat or very satisfied	94	95	92	ns
Provide other types of training	41	77	83	*
Formal job training for new employees	50	65	40	*
Percent somewhat or very satisfied	100	93	96	ns
Retraining of existing employees	65	63	65	ns
Percent somewhat or very satisfied	100	98	84	*
Public school/provider training contracts	4	21	26	*
Percent somewhat or very satisfied	50	87	100	*
Private school/provider training contracts	2	10	19	*
Percent somewhat or very satisfied	100	88	100	ns
Tuition reimbursement	42	52	62	ns
Percent somewhat or very satisfied	100	91	80	*
Other training for skilled workers	34	37	47	ns
Percent somewhat or very satisfied	100	100	100	ns

¹Differences between the three firm sizes that are marked "*" are statistically significant at the .05 level using either a chi square or an exact test (ns is used for not statistically significant the .05 level).

Source: University of Minnesota Duluth, Bureau of Business and Economic Research, 1999.

Firm Survey Methodology

The sampling frame for the study was all current business entities located in the seven-county northeastern Minnesota region plus Douglas County, Wisconsin (the county containing Superior, one of the Twin Port cities). A list of all firms, thought to be accurate through summer 1997, provided basic information on the Minnesota firms. Ultimately, a list of Douglas County firms thought to be complete and up-to-date was reviewed. The Wisconsin list did not include information that could be used to verify firm size. Altogether, 11,102 firms were listed (9,302 in Minnesota and 1,800 in Wisconsin). These ranged from firms with 1 employee/owner to those with over 2,000 employees.

A disproportional, stratified random sample of firms (all sizes) was selected. Stratification was based on county and on reported firm size (except for Douglas County where firm size was not provided). Sample size was selected to minimize costs and provide for reasonably accurate estimates of responses by two grouped regions: the urban Twin Ports area (Superior, Wisconsin, plus the zip codes of southern St. Louis County and Duluth), and the Rural Range area (including other Minnesota counties and northern St. Louis County). A sample size of 313 was achieved with a 96-percent response rate. As expected, a number of firms had gone out of business or relocated since the list was compiled.

A 34-question interview schedule (plus some questions about the experience of the interviewee) was developed and pretested. This included both closed and open-ended items. Interviews were held with the owner, presidents, or person most knowledgeable about the firm's hiring and training needs and practices. Items were asked about the firm's experience in hiring or training skilled labor, about their training programs, how job searches were conducted, and their estimate of problems in finding an appropriate workforce in the future. Fieldwork and data entry were done by the Minnesota Center for Survey Research at the University of Minnesota. Interviews were conducted in February and March 1998.

The data were weighted for analysis. Two weighting schemes were used. One reflects the overall sample design. The other provides for comparisons by firm size where sample results are used to estimate the missing Douglas County firm size data. The overall weighting scheme is used in comparisons of the Range and Port Cities and in the overall totals. The other weighting scheme is used in tables comparing firms by size (but no total percentages from this weighting scheme are used and thus there is no overall total in these tables).

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Nonmetro Areas Fall Behind in the “New Economy”

Fred Gale
David McGranahan

Nonmetro jobs and earnings continued to climb during the 1990s as rural areas enjoyed the effects of the strong national economy. However, nonmetro growth in jobs and earnings was not as fast as metro growth. Service- and technology-based industries that drove the economic expansion of recent years saw nearly all of their growth occur in urban areas, largely leaving rural areas out of the expanding “new economy.”

Recent Rural Trends

The most recent data from the Bureau of Economic Analysis show that nonfarm employment in nonmetro areas reached 26,179,000 in 1998, up 1.7 percent from 25,730,000 in 1997 (fig. 1). Nonmetro employment grew steadily following the end of the last recession in 1991, adding an average of 467,000 jobs annually from 1992 to 1998. Following the national trend, the greatest job growth was in the services industry, followed by retail trade (table 3). The only major nonfarm sectors to lose employment in 1998 were

mining and Federal Government. Nonmetro employment grew in all regions of the country, with annual growth rates ranging from 2.6 percent in the Rocky Mountain region to 1.3 percent in the Far West (see “Regions,” p. 52).

While nonmetro growth in jobs and earnings was healthy from 1995 to 1998, growth was even faster in metro areas. From 1990 to 1995, nonmetro job growth outpaced metro growth, peaking in 1994 at 3.5 percent. But after 1995,

nonmetro job growth slowed to less than 2 percent annually through 1998. Metro employment continued to grow about 2.5 percent annually, and surged 2.7 percent in 1998, a full percentage point higher than the nonmetro rate of growth (fig. 2).

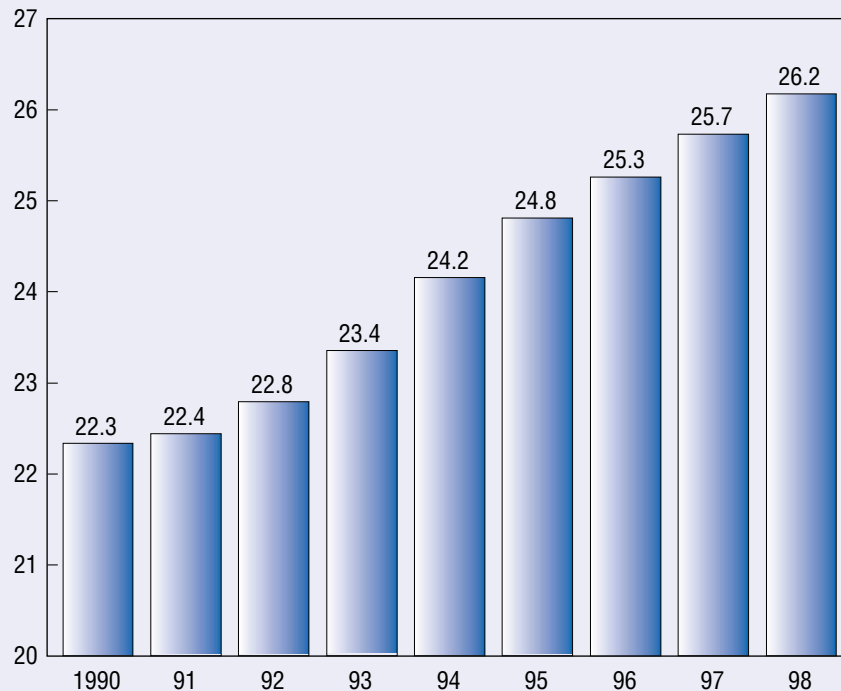
Nonmetro earnings fell further behind metro earnings in 1998 (fig. 3). While real nonmetro earnings per nonfarm job grew 2.4 percent during 1997-98 (the second consecutive year of strong growth), metro

Figure 1

Nonmetro nonfarm employment, 1990-98

Nonmetro job growth was steady from 1992 to 1998

Jobs (million)



Source: ERS analysis of Bureau of Economic Analysis data.

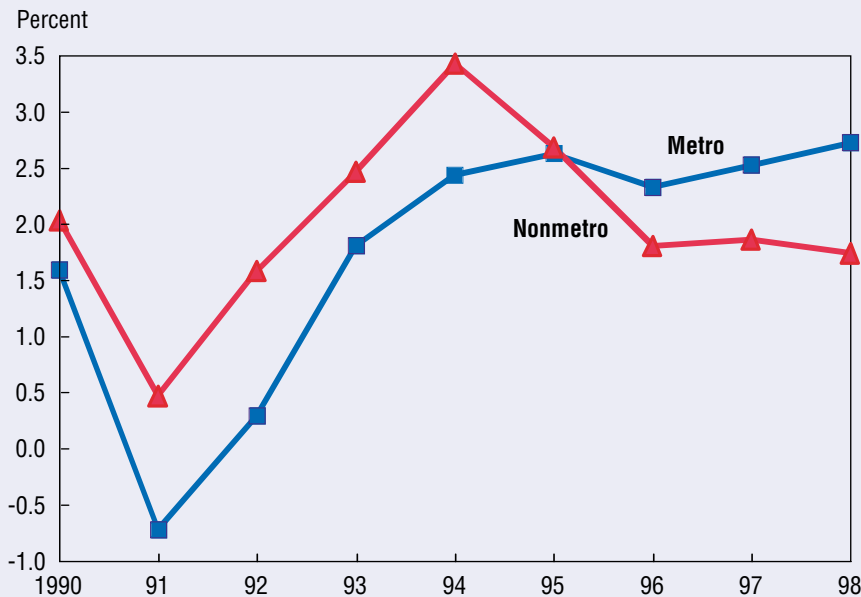
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Figure 2

Metro and nonmetro nonfarm job growth, 1990-98

Nonmetro job growth lagged metro growth during 1996-98



Source: ERS analysis of Bureau of Economic Analysis data.

earnings growth was even stronger, at 3.4 percent. Prior to 1996-98, there had been no sustained growth in real nonmetro earnings per job since the 1970s. The \$24,399 average earnings per job for 1998 was almost identical to the 1978 average of \$24,322 (in 1998 dollars). The metro-nonmetro earnings gap grew from \$5,893 per job in 1978 to \$10,900 in 1998, the highest inflation-adjusted gap since the data series began in 1969. The average nonmetro job paid only 69.1 percent of the average metro job's pay, also an historical low.

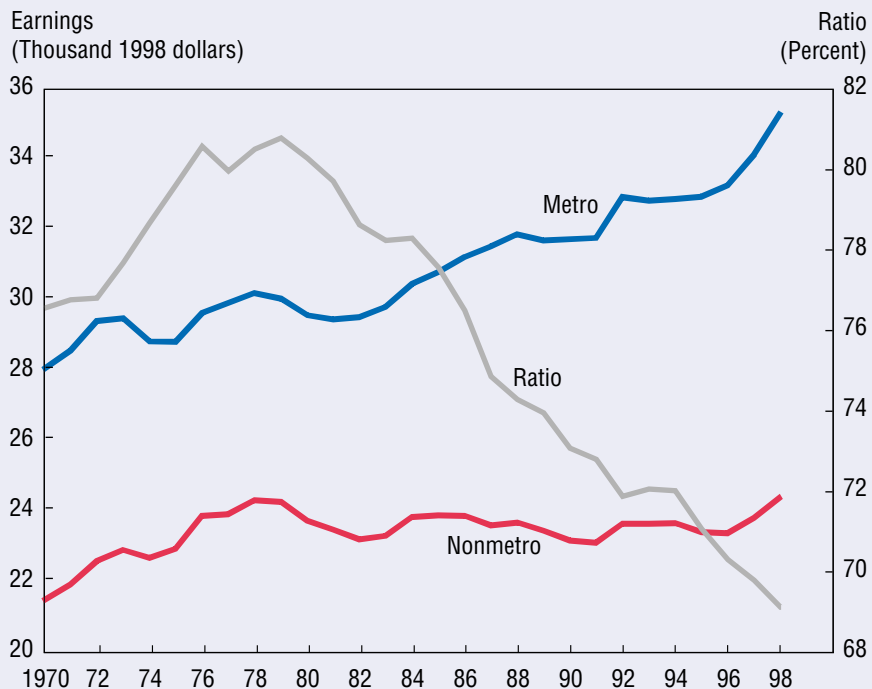
Are Rural Areas Sharing in the New Economy?

One explanation for the growing wage gap between rural and urban jobs could be the failure of nonmetro areas to fully participate in the knowledge- and technology-based "new economy" that many observers credit for the U.S. economic expansion during the 1990s.

Figure 3

Real earnings per nonfarm job, metro and nonmetro counties, 1970-98

The metro-nonmetro earnings gap widened during the 1990s



Source: ERS analysis of Bureau of Economic Analysis data.

More and more, U.S. industries must rely on innovation, information, knowledge, and new technology for their competitive advantage in both domestic and foreign markets. Basic commodities and "old economy" products made by unskilled and semi-skilled workers can often be bought more cheaply from overseas competitors. At the same time, many companies have sought cost efficiencies by automating production and outsourcing many functions (such as accounting, market analysis, data processing, and software development) that had previously been performed internally. These developments have led to explosive growth in the "producer services" sector that includes communications, finance and insurance, legal, accounting, temporary employment services,

Table 1

Industry shares of metro and nonmetro earnings growth, 1995-98

Metro	Percent	Nonmetro	Percent
Producer services	41.0	Consumer services	28.2
Consumer services	19.7	Government and related	15.2
Transportation, utilities, and wholesale	11.2	Producer services	13.6
Manufacturing	8.9	Manufacturing	12.7
Construction	7.5	Construction	10.1
Government and related	5.8	Transportation, utilities, and wholesale	9.9
Recreation	3.8	Agriculture, forestry, fishing	5.7
Mining	1.1	Recreation	4.4
Agriculture, forestry, fishing	1.0	Mining	0.2

Source: ERS analysis of Bureau of Economic Analysis data.

computer-related, security, advertising, consulting, and similar service businesses whose customers are usually other businesses.

Manufacturers are reducing their requirements for workers with "old economy" skills (mechanical ability, physical strength, ability to operate machines or equipment) by automating repetitive tasks on shop floors. High-paying jobs in "new economy" sectors rely on knowledge, information gathering and processing, and decisionmaking.

Producer Services Explosion Misses Rural America

Much of national earnings growth during the 1990s was in "new economy" producer services industries, but nearly all of that growth was in urban areas. Metro earnings from producer services industries grew 9 percent annually between 1995 and 1998. Producer services were by far the largest contributor to metro earnings growth, accounting for 41 percent of the 1995-98 increase in metro earnings.

In nonmetro areas, producer service earnings grew 6 percent annually from 1995 to 1998, faster than any other nonmetro sector but only two-thirds of the metro rate.

The sector is also relatively small in nonmetro areas and, with a slower rate of growth and a smaller base on which to build, producer services accounted for only 13.6 percent of 1995-98 nonmetro earnings growth, much less than in metro areas (table 1). In nonmetro areas, producer services were the third-largest contributor to earnings

growth, following consumer services (28 percent, including health services, personal services, and retail trade), and government (15 percent, including schools and educational institutions, State and local government, prisons and other institutions, Federal agencies, and military personnel). While rural areas have 20 percent of the U.S. population and about 13 percent of total earnings, they captured only 4 percent of the national growth in producer services during 1995-98. Few of the highly paid managerial and professional jobs created by the sector during the 1990s were located in rural areas.

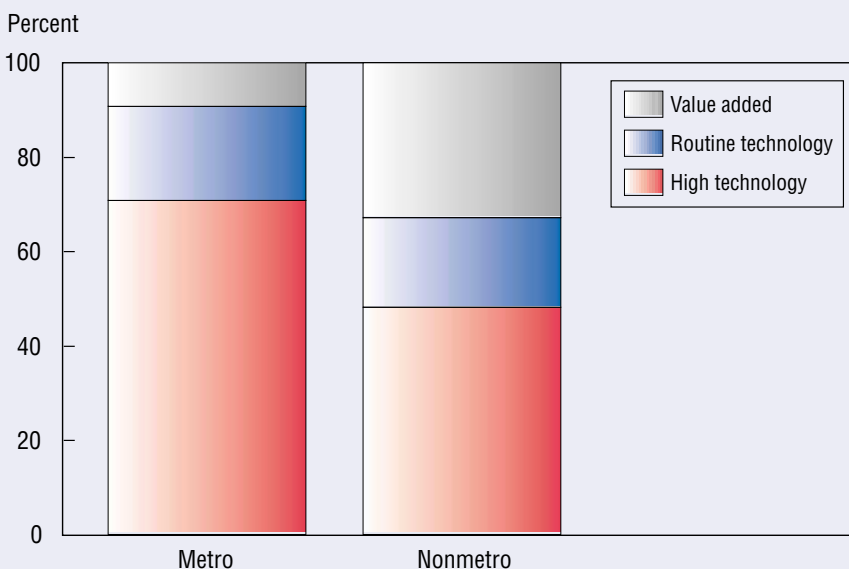
Rural Areas Lag in High-Tech Manufacturing

While producer services are gaining in importance, manufacturing is still important to rural areas. In 1998, manufacturing contributed 22.3 percent of all nonmetro earn-

Figure 4

Shares of manufacturing earnings growth by type of industry, nonmetro and metro counties, 1995-98

Metro manufacturing is more high-tech than is nonmetro manufacturing



Source: ERS analysis of Bureau of Economic Analysis data.

Table 2

Growth in real earnings by manufacturing industry and type, metro and nonmetro counties, 1995-98

Metro industry	Type ¹	Earnings growth	Nonmetro industry	Type ¹	Earnings growth
<i>1,000 dollars</i>			<i>1,000 dollars</i>		
Industrial machinery and equipment	HT	13,131,205	Industrial machinery and equipment	HT	1,858,421
Electronic and electrical equipment	HT	12,790,681	Food and kindred products	VA	1,214,050
Instruments and related products	HT	5,650,680	Lumber and wood products	VA	1,199,617
Other transportation equipment	HT	4,867,399	Fabricated metal products	R	1,085,888
Chemicals and allied products	HT	4,813,878	Rubber and misc. plastics products	R	718,457
Printing and publishing	HT	4,777,710	Primary metal industries	R	514,070
Fabricated metal products	R	3,407,230	Furniture and fixtures	R	440,716
Food and kindred products	VA	2,878,193	Other transportation equipment	HT	439,733
Rubber and misc. plastics products	R	2,715,900	Chemicals and allied products	HT	332,520
Stone, clay, and glass products	R	2,094,042	Printing and publishing	HT	325,515
Furniture and fixtures	R	1,792,937	Electronic and electrical equipment	HT	314,686
Lumber and wood products	VA	1,788,854	Stone, clay, and glass products	R	282,790
Miscellaneous manufacturing	R	1,116,518	Paper and allied products	VA	281,803
Primary metal industries	R	796,849	Instruments and related products	HT	225,808
Paper and allied products	VA	581,110	Motor vehicles and equipment	HT	203,280
Petroleum and coal products	HT	337,267	Miscellaneous manufacturing industries	R	125,048
Tobacco products	VA	-25,082	Petroleum and coal products	HT	-3,822
Textile mill products	R	-110,099	Tobacco products	VA	-43,453
Leather and leather products	VA	-190,083	Leather and leather products	VA	-142,692
Apparel and other textile products	R	-692,497	Textile mill products	R	-380,046
Motor vehicles and equipment	HT	-7,015,522	Apparel and other textile products	R	-1,330,827
Total manufacturing		55,507,170	Total manufacturing		7,661,561

Note: Industries correspond to 2-digit SIC codes, except for motor vehicles and equipment (SIC 371) and nonmotor vehicle equipment (SIC 37, exc. 371). Industries are sorted by earnings growth.

¹Type of manufacturing industry: HT = high-technology; VA = value-added; R = routine technology.

Source: ERS analysis of Bureau of Economic Analysis data.

ings (16 percent in metro areas). Looking at the types of manufacturing in rural and urban areas further magnifies the “new” versus “old” economy differences. Rural areas tend to specialize in “old economy” routine mass production activities (textiles, apparel, furniture, metal working, rubber and plastics, stone, clay, and concrete) and value-added manufacturing (food, wood, and leather products), which involve low- to medium-skilled workers and relatively few managers and professionals. Urban areas specialize in more high-tech manufacturing (electronic, industrial and office equipment, instruments,

chemicals, printing, publishing, and petroleum).

“High-tech” industries are providing most of the growth in manufacturing earnings, but rural areas’ growth has been limited by their dependence on slower-growing value-added industry and routine technology manufacturing (see “Industry Definitions”). Between 1995 and 1998, 70 percent of growth in metro manufacturing earnings came from high-tech manufacturing industries (fig. 4), led by industrial machinery and equipment, electrical equipment, instruments, nonmotor vehicle transportation equipment (such as aircraft), chemicals, and printing

and publishing (table 2). In non-metro areas, high-tech industries accounted for half of manufacturing earnings growth. Industrial machinery and equipment was the leading contributor to nonmetro manufacturing earnings growth, as it was in metro counties, but the second- and third-largest contributors were value-added industries (food/kindred products and lumber/wood products), followed by four routine manufacturing industries (fabricated metal products, primary metals, rubber and plastics, furniture and fixtures). Value-added industries contributed 30 percent of nonmetro manufacturing earnings growth, compared with less than

Industry Definitions (based on 2-digit SIC code)

SIC code	Description
01 to 09	Agricultural production and services, forestry, fishing *
10 to 14	Mining
15 to 17	Construction
Value-added industries¹	
20	Food and kindred products
21	Tobacco products
24	Lumber and wood products
26	Paper and allied products
31	Leather and leather products
Routine manufacturing	
22	Textile mill products
23	Apparel and other textile products
25	Furniture and fixtures
30	Rubber and miscellaneous plastics
32	Stone, clay, and concrete products
33	Primary metal industries
34	Fabricated metal products
371	Motor vehicles and equipment
39	Miscellaneous manufacturing industries
High-technology manufacturing²	
27	Printing, publishing, and allied
28	Chemicals and allied productions
29	Petroleum and coal products
35	Industrial machinery and equipment
36	Electronic and other electric equipment
37	Transportation equipment (except 371, motor vehicles)
38	Instruments and related products
Producer services³	
48	Communications
60 to 64, 67	Finance and insurance
73, 81, 87	Business/professional (legal and research) services
Transportation, utilities, and wholesale	
40 to 47	Transportation
48	Utilities
50 to 51	Wholesale trade
Recreation	
58	Eating and drinking places
70	Hotels and other lodging
79	Amusement and recreation services
84	Museums, art galleries, and botanical/zoological gardens
Consumer services	
52 to 59	Retail trade
72, 75 to 78, 80, 82, 83, 86, 88	Services other than business and recreation
Government and government enterprises	
91 to 99	Federal civilian and military, State and local government, and post office

*BEA data also include employees of foreign governments and international organizations here.

¹Based on *Rural Conditions and Trends*, Vol. 8, No. 3 (1998), pp. 44-46.

²Based on McGranahan in *Rural Development Perspectives*, Vol. 4, No. 3, pp. 7-12.

³Adapted from Beyers and Lindhal in *Rural Development Perspectives*, Vol. 11, No. 3, pp. 3-10.

10 percent in metro counties. Routine manufacturing industries contributed about 20 percent of 1995-98 manufacturing earnings growth in both metro and non-metro counties, but the nonmetro economy was hurt by its dependence on textile and apparel industries, which lost a combined \$1.7 billion in nonmetro real earnings between 1995 and 1998. Nearly 70 percent of the decline in apparel, textile, and leather product earnings occurred in nonmetro counties.

Can Rural Areas Close the Earnings Gap?

The urban orientation of high-tech and service businesses is not due to a lack of information or sophistication on the part of rural business owners. The ERS Rural Manufacturing Survey showed that rural manufacturers are just as likely as similar urban manufacturers to adopt the most advanced technologies and management practices appropriate to their industry. The issue is, rather, that the types of businesses that use advanced technologies and thrive on innovation are more likely to locate in urban than in rural areas.

Businesses in cutting-edge industries—computers, medicine, spacecraft, biotechnology, and the like—operate in rapidly changing, uncertain environments. They tend to maintain research staffs to create or at least keep abreast of new products and designs, and they make extensive use of outside consultants and advisors on finance, design, engineering, and marketing. These companies also tend to spawn new businesses that are set up locally. Knowledge, information, and ideas are important to these businesses, and they usually prefer urban or suburban locations where

Table 3

Nonfarm jobs, by industry and BEA region, 1998

Sector	1998 totals		1997-98 change		1991-98 average change	
	Nonmetro	Metro	Nonmetro	Metro	Nonmetro	Metro
	<i>Thousands</i>		<i>Percent</i>			
Total nonfarm jobs	26,179	130,893	1.7	2.7	1.7	1.6
By industry:						
Agricultural services, forestry, fisheries, other ¹	523	1,520	2.3	4.1	3.3	3.6
Mining	346	509	-2.4	-0.7	-1.7	-1.6
Construction	1,616	7,183	3.8	5.0	3.3	2.8
Manufacturing	4,445	15,123	0.4	1.1	0.8	0.1
Transportation and public utilities	1,132	6,536	2.0	3.5	1.4	1.7
Wholesale trade	878	6,474	1.0	2.5	1.0	1.1
Retail trade	4,820	21,890	1.5	1.9	2.1	1.7
Finance, insurance and real estate	1,340	10,890	3.2	4.4	2.2	1.6
Services	6,689	43,209	2.8	3.7	2.5	2.7
Government and government enterprises ²	4,390	17,558	1.0	0.8	0.7	0.3
Federal civilian	363	2,445	-0.1	-0.7	-0.6	-1.0
Federal military	368	1,730	-2.9	-3.5	-2.0	-2.1
State and local	3,659	13,383	1.6	1.6	1.3	1.0
State	981	3,805	1.0	0.7	0.9	0.7
Local	2,678	9,578	1.8	2.0	1.4	1.1
By BEA region:						
New England	1,169	7,230	2.4	2.2	1.2	1.1
Mideast	1,824	23,683	1.9	2.2	0.8	0.7
Great Lakes	4,464	21,357	1.5	2.0	1.7	1.4
Plains	4,073	7,751	2.0	2.6	1.7	1.8
Southeast	8,697	28,793	1.5	2.8	1.7	2.2
Southwest	2,481	14,306	2.0	3.9	1.8	2.6
Rocky Mountain	1,568	3,931	2.6	3.6	2.9	3.0
Far West	1,903	23,841	1.3	3.1	1.6	1.2

¹"Other" are employees of foreign embassies working in the United States.

²Government enterprises are government agencies that cover a substantial portion of their operating costs by selling goods and services to the public and that maintain their own separate accounts—for example, the postal service.

Source: Calculated by ERS using data from the Bureau of Economic Analysis.

Definitions

Bureau of Economic Analysis employment data provide annual establishment data on the number of jobs per county. The BEA data are taken primarily from administrative reports filed by employers covered under unemployment insurance laws and from information gathered by the Internal Revenue Service and the Social Security Administration. Jobs and earnings for these jobs are counted at the place of work; thus, residents of nonmetro counties who commute to jobs in metro counties are classified as metro workers. The data are based on a virtual universal count rather than a sample. The BEA data provide detailed information on the number of jobs and amount of earnings by industry at the county level. A shortcoming of the BEA data is the 2-year lag between when they are collected and when they are available for analysis. Data for 1998 were made available during summer 2000.

information about markets, new technologies, and product ideas is readily available.

Some commentators suggest that, despite the advent of information technology, face-to-face contacts remain important for gathering information and ideas. Those contacts are easier to come by in urban areas or other places where there are "agglomerations" of firms doing similar business, such as Silicon Valley, Austin, TX, or the Route 128 corridor in Massachusetts (high tech); Dalton, GA

Table 4

Earnings per nonfarm job, by industry and BEA region, 1998

	1998		1997-98		1991-98	
	Nonmetro	Metro	Nonmetro	Metro	Nonmetro	Metro
	<i>Dollars</i>		<i>Percent</i>			
Earnings per nonfarm job	24,399	35,298	2.4	3.4	0.6	1.1
By industry:						
Agricultural services, forestry, fisheries, other ¹	13,063	18,171	4.9	4.7	-1.5	-0.3
Mining	41,907	65,736	2.4	5.6	1.2	5.5
Construction	26,252	36,162	3.2	3.1	0.3	0.5
Manufacturing	33,202	49,169	2.5	3.3	1.0	1.3
Transportation and public utilities	36,949	48,277	2.2	1.7	0.6	1.2
Wholesale trade	29,765	46,847	3.7	5.0	1.2	1.5
Retail trade	14,018	18,144	2.3	3.4	0.0	0.6
Finance, insurance and real estate	18,989	41,482	3.2	5.2	2.1	4.1
Services	19,663	31,757	3.0	4.1	0.9	1.1
Government and government enterprises ²	30,725	40,774	2.1	1.8	0.7	0.8
Federal civilian	53,435	62,862	2.3	1.6	1.4	1.5
Federal military	26,429	34,931	2.1	1.8	0.7	0.9
State and local	28,903	37,494	2.1	2.1	0.7	0.7
State	32,212	37,431	2.2	1.5	0.4	0.6
Local	27,690	37,519	2.1	2.3	0.8	0.7
By BEA region:						
New England	26,340	38,643	2.1	3.8	0.5	1.3
Mideast	26,370	40,486	2.8	2.8	0.5	1.2
Great Lakes	25,433	35,046	2.6	3.2	0.7	1.2
Plains	22,581	32,424	2.6	3.2	0.7	1.2
Southeast	24,322	31,422	2.4	3.5	0.7	1.0
Southwest	22,831	33,740	2.2	4.2	0.3	1.4
Rocky Mountain	23,350	32,008	2.5	4.3	0.4	1.5
Far West	26,041	36,451	1.8	3.8	0.0	1.0

Note: Change from previous year is in real 1998 dollars. Previous year's earnings were converted to 1998 dollars using the chain-type personal consumption expenditures price index.

¹"Other" are employees of foreign embassies working in the United States.

²Government enterprises are government agencies that cover a substantial portion of their operating costs by selling goods and services to the public and that maintain their own separate accounts—for example, the postal service.

Source: Calculated by ERS using data from the Bureau of Economic Analysis.

(carpets and textiles); Hartford, CT (insurance); or Wall Street (finance). Except where there are colleges and universities or amenities attractive to professional workers (attractive scenery, good weather, recreational or cultural opportunities, good schools), rural areas do not generally have a large enough professional-level workforce to attract or develop "new economy" industries.

As information technology develops, it may overcome the disadvantages of fewer face-to-face contacts so that consultants, financial professionals, accountants, and software developers can live and work in rural areas. Still, rural areas must offer natural amenities, good schools, access to transportation networks, and other infrastructure to attract high-wage professionals who work in "new economy"

industries. An educated, trainable workforce is also important to attract service and high-tech jobs. Without these jobs, the earnings gap between urban and rural America is likely to continue widening. **RA**

Table 5

Real earnings per nonfarm job, 1969-98

	Nonfarm earnings			Metro-nonmetro earnings gap ¹	Earnings ratio ²	Change from previous year	
	U.S.	Nonmetro	Metro			Nonmetro	Metro
	<i>1998 dollars</i>					<i>Percent</i>	
1969	26,558	21,159	27,691	6,532	76.4	NA	NA
1970	26,906	21,471	28,047	6,576	76.6	1.5	1.3
1971	27,409	21,933	28,573	6,640	76.8	2.1	1.9
1972	28,209	22,590	29,411	6,821	76.8	3.0	2.9
1973	28,346	22,918	29,502	6,584	77.7	1.5	0.3
1974	27,756	22,685	28,836	6,151	78.7	-1.0	-2.3
1975	27,789	22,950	28,825	5,875	79.6	1.2	0.0
1976	28,612	23,884	29,640	5,756	80.6	4.1	2.8
1977	28,859	23,931	29,928	5,997	80.0	0.2	1.0
1978	29,171	24,322	30,215	5,893	80.5	1.6	1.0
1979	29,044	24,284	30,059	5,774	80.8	-0.2	-0.5
1980	28,549	23,734	29,564	5,830	80.3	-2.3	-1.6
1981	28,421	23,482	29,456	5,974	79.7	-1.1	-0.4
1982	28,433	23,213	29,521	6,308	78.6	-1.1	0.2
1983	28,693	23,318	29,804	6,486	78.2	0.5	1.0
1984	29,336	23,846	30,457	6,611	78.3	2.3	2.2
1985	29,647	23,892	30,801	6,909	77.6	0.2	1.1
1986	30,017	23,888	31,225	7,337	76.5	0.0	1.4
1987	30,230	23,604	31,533	7,928	74.9	-1.2	1.0
1988	30,543	23,683	31,881	8,198	74.3	0.3	1.1
1989	30,351	23,444	31,700	8,256	74.0	-1.0	-0.6
1990	30,332	23,190	31,732	8,542	73.1	-1.1	0.1
1991	30,327	23,119	31,756	8,637	72.8	-0.3	0.1
1992	31,374	23,667	32,923	9,257	71.9	2.4	3.7
1993	31,280	23,654	32,822	9,167	72.1	-0.1	-0.3
1994	31,310	23,670	32,870	9,200	72.0	0.1	0.1
1995	31,326	23,414	32,943	9,529	71.1	-1.1	0.2
1996	31,598	23,389	33,267	9,878	70.3	-0.1	1.0
1997	32,398	23,823	34,130	10,306	69.8	1.9	2.6
1998	33,482	24,399	35,298	10,900	69.1	2.4	3.4

Note: Earnings were converted to 1998 dollars using chain-type personal consumption expenditures price index.

NA = Data for years prior to 1969 were not available to compute change.

¹Earnings gap is the difference between metro and nonmetro earnings in 1998 dollars.

²Earnings ratio is nonmetro earnings as a percentage of metro earnings.

Source: Calculated by ERS using data from the Bureau of Economic Analysis and 1993 metropolitan classification.

Regions (Bureau of Economic Analysis)

New England—Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont.

Mideast—Delaware, District of Columbia, Maryland, New Jersey, New York, and Pennsylvania.

Great Lakes—Illinois, Indiana, Michigan, Ohio, and Wisconsin.

Plains—Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, and South Dakota.

Southeast—Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, and West Virginia.

Southwest—Arizona, New Mexico, Oklahoma, and Texas.

Rocky Mountain—Colorado, Idaho, Montana, Utah, and Wyoming.

Far West—Alaska, California, Hawaii, Nevada, Oregon, and Washington.

For Further Reading . . .

ERS Rural Industry Briefing Room: <http://www.ers.usda.gov/briefing/Industry>

Federal Reserve Bank of Kansas City, "Economic Forces Shaping the Rural Heartland," conference proceedings, 1996. <<http://www.kc.frb.org/PUBLICAT/heartlnd/Hrtmain.htm>>

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Agricultural Wholesale and Retail Trade Jobs Account For Two-Thirds of Farm and Farm-Related Employment

Alex Majchrowicz

Farming and its related industries provided 22.9 million jobs, or slightly below 15 percent of total U.S. employment, in 1997 (table 1). About a third of farm and farm-related employment came from farm production and its closely related industries, which include agricultural services, forestry, and fishing; agricultural inputs; and firms that process and market agricultural goods. But industries peripherally related to farming—particularly wholesale and retail trade of agricultural products—accounted for more than two-thirds of farm and farm-related employment.

Over 6.2 million farm and farm-related jobs were in nonmetro counties in 1997 (table 2). These jobs accounted for about 23 percent of all nonmetro employment, a larger share than for the Nation as a whole. Farming and its closely related industries provided over one-half of farm and farm-related employment in nonmetro counties. Wholesale and retail trade industries remained an important source of jobs for nonmetro workers, accounting for approximately 43 percent of nonmetro farm and farm-related employment.

Nonmetro areas of two Northern Plains States relied the most on farm and farm-related industries for jobs. These industries accounted for almost one-third of the total nonmetro employment in Nebraska (31.2 percent) and North Dakota (30.3 percent). Farm production jobs alone provided over one-half of the farm and farm-related employment in North Dakota. In more farm-oriented States, wholesale and retail trade industries generally comprise a relatively small share of employment (about 30 percent in Nebraska and North Dakota) as these industries depend on consumer markets not found in less populated areas.

ERS estimates farm and farm-related employment by combining the Census Bureau's County Business Patterns data with farm employment data from the Bureau of Economic Analysis. These estimates are rich in geographic detail that can provide valuable information about the importance of agriculture in various regions of the country. Their timeliness, though, is hindered because over 2 years

occur between data collection, calculation, and release. Farm and farm-related employment includes not only the 3.1 million jobs in farm production but also 4 million jobs in closely related industries (agricultural services, forestry, and fishing; and processing and marketing of agricultural goods), as well as 15.8 million jobs in industries peripherally related to farming (wholesale and retail trade of agricultural products and indirect agribusiness). Farm and farm-related industries are identified as industries having 50 percent or more of their national workforce employed in providing goods and services necessary to satisfy the final demand for agricultural products. An exception to this criterion is indirect agribusiness (such as chemical and fertilizer mining) in which percentages range between 32 and 50 percent. **RA**

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Table 1

Share of total State employment by farm and farm-related industry, 1997

State	Total farm and farm-related industries	Total farm and farm-related industries	Farm production, ag. services, forestry, and fishing	Agricultural inputs	Agricultural processing and marketing	Agricultural wholesale and retail trade	Indirect agribusiness
	<i>Jobs</i>		<i>Percent of total employment</i>				
United States	22,905,453	14.9	2.4	0.3	2.0	9.9	0.4
Alabama	419,342	17.9	2.9	.4	4.4	9.7	.6
Alaska	53,423	14.7	3.2	.1	2.3	9.1	—
Arizona	312,158	12.8	1.2	.2	.6	10.7	.1
Arkansas	293,020	20.7	5.4	.6	5.0	8.9	.8
California	2,517,141	14.3	2.0	.2	2.0	9.9	.3
Colorado	369,270	14.3	2.1	.2	1.3	10.6	.2
Connecticut	223,604	11.0	.8	.1	.7	9.1	.3
Delaware	63,531	13.4	1.3	.2	2.2	9.5	.3
Florida	1,146,475	14.6	1.7	.2	1.0	11.5	.2
Georgia	732,221	16.5	1.9	.3	3.6	10.1	.6
Hawaii	118,002	16.2	1.9	.1	1.3	12.9	—
Idaho	140,112	20.4	6.2	1.0	2.9	9.9	.3
Illinois	955,759	13.6	1.7	.6	1.6	9.2	.5
Indiana	512,272	14.9	2.6	.4	1.4	10.0	.5
Iowa	403,835	22.2	6.9	1.6	3.6	9.5	.5
Kansas	304,565	18.3	5.2	.8	2.6	9.4	.3
Kentucky	417,239	19.3	5.7	.3	2.7	10.1	.5
Louisiana	338,314	14.8	2.4	.4	1.5	10.1	.4
Maine	117,685	16.7	2.6	.1	3.0	10.7	.4
Maryland	350,618	12.2	1.0	.1	1.0	9.9	.2
Massachusetts	477,231	12.3	.5	.1	1.2	10.1	.4
Michigan	683,362	12.9	1.7	.1	.8	10.1	.3
Minnesota	487,167	15.5	3.5	.6	1.9	9.2	.4
Mississippi	259,590	18.5	4.4	.5	3.9	9.3	.5
Missouri	544,962	16.3	4.1	.5	2.1	9.3	.4
Montana	98,099	19.5	6.7	.6	.8	11.3	.3
Nebraska	240,489	21.8	6.6	1.7	4.0	9.4	.2
Nevada	108,797	10.5	.7	.1	.4	9.2	.1
New Hampshire	97,242	13.7	1.1	.1	1.2	10.9	.4
New Jersey	538,909	11.8	.6	.1	1.5	9.3	.4
New Mexico	129,859	14.4	2.7	.2	.8	10.4	.3
New York	1,178,600	12.0	.9	.1	1.5	9.3	.3
North Carolina	846,375	18.5	2.3	.3	5.7	9.6	.6
North Dakota	98,899	23.5	9.5	1.8	2.3	9.9	—
Ohio	891,486	13.7	1.8	.2	1.1	10.1	.5
Oklahoma	327,939	17.5	5.6	.3	1.5	9.9	.2
Oregon	337,929	17.3	4.8	.3	1.4	10.4	.3
Pennsylvania	951,566	14.3	1.5	.2	2.2	10.0	.4
Rhode Island	70,743	13.0	.5	.1	1.7	10.3	.5
South Carolina	386,551	18.1	1.9	.2	4.6	10.6	.8
South Dakota	104,436	22.3	8.5	1.1	2.8	9.7	.2
Tennessee	559,616	17.2	3.6	.3	2.9	9.9	.5
Texas	1,616,209	14.6	2.9	.2	1.5	9.7	.3
Utah	160,770	13.0	1.8	.2	1.3	9.5	.3
Vermont	60,212	16.5	3.2	.2	1.6	11.3	.2
Virginia	570,877	14.2	1.9	.2	2.4	9.3	.4
Washington	517,962	16.0	3.5	.3	1.6	10.3	.4
West Virginia	124,632	14.8	3.0	.2	1.1	10.3	.2
Wisconsin	555,023	17.4	3.6	.6	2.4	9.9	.8
Wyoming	49,805	16.6	4.4	.5	.5	10.2	1.1

— = Less than 0.1 percent

Source: Calculated by ERS using Department of Commerce data.

Table 2

Share of total nonmetro employment by farm and farm-related industry, 1997

State	Total farm and farm-related industries	Total farm and farm-related industries	Farm production, ag. services, forestry, and fishing	Agricultural inputs	Agricultural processing and marketing	Agricultural wholesale and retail trade	Indirect agribusiness
	<i>Jobs</i>	<i>Percent of total employment</i>					
United States	6,225,848	22.9	7.8	0.8	3.9	9.9	0.5
Alabama	176,874	27.5	6.2	.8	10.6	8.9	1.0
Alaska	35,475	18.7	5.4	.2	4.0	9.1	—
Arizona	45,891	16.6	2.3	.2	.3	13.7	.1
Arkansas	170,935	25.4	8.8	.9	6.5	8.7	.6
California	99,434	21.5	7.9	.6	1.4	11.5	.2
Colorado	103,352	22.3	7.1	.5	1.7	12.8	.1
Connecticut	19,990	15.2	2.0	.1	2.4	9.9	.8
Delaware	19,251	28.4	4.4	.7	9.3	13.8	.1
Florida	94,970	22.9	7.8	.6	1.7	12.6	.4
Georgia	278,704	23.8	5.2	.7	7.8	9.2	.9
Hawaii	40,416	22.2	5.6	.1	2.0	14.5	—
Idaho	105,160	23.9	8.4	1.3	3.4	10.4	.4
Illinois	207,660	22.1	8.0	1.6	2.4	9.5	.5
Indiana	168,876	19.3	6.1	.8	2.4	9.3	.8
Iowa	257,936	27.6	11.6	2.1	4.4	8.9	.6
Kansas	182,088	26.2	10.6	1.5	4.6	9.2	.4
Kentucky	228,381	24.4	10.0	.5	3.9	9.6	.5
Louisiana	90,307	21.0	7.7	.9	2.8	8.8	.8
Maine	67,593	17.9	3.9	.1	2.9	10.6	.4
Maryland	39,988	19.7	4.2	.3	3.3	11.6	.3
Massachusetts	7,627	14.8	2.3	.1	1.0	10.8	.6
Michigan	139,729	17.9	5.0	.4	1.0	11.1	.4
Minnesota	213,324	25.7	9.8	1.6	4.1	9.8	.5
Mississippi	192,186	21.4	6.1	.6	5.2	8.8	.7
Missouri	230,590	25.3	11.4	.9	3.9	8.9	.3
Montana	77,783	20.6	8.1	.6	.7	11.0	.3
Nebraska	151,762	31.2	13.6	2.8	5.3	9.4	.1
Nevada	16,946	12.3	3.3	.3	.3	8.3	.2
New Hampshire	38,890	14.3	1.6	.1	1.2	11.0	.4
New Jersey	N.A.						
New Mexico	61,150	18.8	5.6	.3	.9	11.4	.7
New York	112,638	16.7	4.2	.3	1.4	10.4	.4
North Carolina	315,311	25.5	4.8	.4	9.7	9.7	.8
North Dakota	65,556	30.3	16.1	2.2	2.8	9.2	—
Ohio	205,939	19.4	5.6	.7	2.2	9.8	1.1
Oklahoma	165,180	25.6	12.5	.6	2.7	9.5	.3
Oregon	118,984	23.3	9.6	.6	1.8	11.0	.4
Pennsylvania	160,815	18.8	4.3	.3	3.2	10.5	.6
Rhode Island	6,415	14.1	1.1	—	.3	12.7	—
South Carolina	127,865	24.4	3.9	.4	9.1	10.1	.9
South Dakota	75,602	26.3	12.6	1.5	2.8	9.3	.1
Tennessee	209,097	24.1	8.7	.5	5.5	8.6	.7
Texas	387,967	27.2	14.2	.9	3.1	8.8	.3
Utah	47,601	19.4	6.1	.4	1.9	10.7	.4
Vermont	40,955	17.2	3.8	.2	1.3	11.7	.1
Virginia	170,861	23.5	6.0	.5	7.1	9.2	.8
Washington	121,530	25.8	10.7	.8	2.4	11.1	.9
West Virginia	68,323	15.7	4.5	.2	1.3	9.5	.1
Wisconsin	223,314	24.4	8.4	1.3	3.4	10.5	.8
Wyoming	38,627	18.6	5.6	.5	.7	10.3	1.6

— = Less than 0.1 percent

N.A. = Not applicable. New Jersey has no nonmetro counties.

Source: Calculated by ERS using Department of Commerce data.

Food and Fiber System Share of GDP Remains Robust

William Edmondson

The food and fiber system's (FFS) share of total Gross Domestic Product (GDP) reached 16.4 percent in 1999, continuing the upward trend seen through most of the 1990s. In 1991, the share was only 14.7 percent. This increase reflects a move by both domestic and foreign consumers away from low-value bulk commodities towards a market basket filled with more high-value processed products. The share of total employment generated by the FFS has trended downward from 18.8 percent in 1991 to 17.4 percent in 1999 (table 1). High labor productivity in the farm sector coupled with a stable set of real final demands for agricultural and food products compared with an expansive nonfarm economy produces a diminishing relative share of total employment.

The food and fiber system as a whole added \$1.5 trillion to the Nation's GDP in 1999 (table 2). Of this, \$984 billion came from manufacturing and distribution, while \$468 billion came from inputs. The farm sector by itself accounted for \$69.8 billion.

The industries within the FFS generate benefits to the total economy in different ways. There were wide differences between some industries' contributions to GDP and share of employment. In some manufacturing industries—inputs, food processing, and tobacco, for example—the share contributed to GDP was more than twice the share of employment. By contrast, the relatively low-wage, labor-intensive food service sector job share was nearly twice its value-added share.

The food and fiber system comprises the producers of goods and services required to assemble, process, and distribute raw farm products to U.S. and foreign consumers. Food and fiber system employment estimates are developed using a national input-output model that describes input use and factor payments for each sector of the economy. The model is used to

estimate the amount of employment in each sector needed to support the final demands for agricultural products. Thus, this measure may include jobs in all sectors of the economy, even those where the link to agriculture is weak. Unlike the farm-related employment measure used in the previous article, food and fiber sector estimates do not count all jobs in a particular sector; only the jobs needed to support demand for agricultural products are counted. Food and fiber sector estimates have a close relationship to the U.S. Department of Commerce's National Income and Product Accounts. **RA**

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Table 1

Key statistical indicators of the food and fiber sector

	1991	1992	1993	1994	1995	1996	1997	1998	1999
U.S. civilian employment (mil.) ¹	126.3	128.1	129.2	131.1	132.3	133.9	136.3	137.7	139.4
Food and fiber (mil.)	23.7	23.1	23.6	24.2	24.5	24.2	24.1	24.0	24.3
Percent of employment	18.8	18.0	18.3	18.5	18.5	18.1	17.7	17.4	17.4
Farm sector (mil.)	2.0	1.9	1.8	1.9	2.0	2.0	1.9	1.8	1.7
U.S. gross domestic product (\$ bil.)	5,986.2	6,318.9	6,642.3	7,054.3	7,400.5	7,813.2	8,318.4	8,790.2	9,299.2
Food and fiber—value added (\$ bil.)	877.5	924.8	965.7	1,066.2	1,126.5	1,210.4	1,317.1	1,446.4	1,521.4
Percent of gross domestic product	14.6	14.6	14.5	15.1	15.2	15.4	15.8	16.4	16.3
Farm sector—value added (\$ bil.) ²	71.1	75.5	73.1	78.3	75.3	86.7	83.5	74.8	69.8

¹U.S. Department of Labor, Bureau of Labor Statistics.²Value-added data presented here are consistent with U.S. Department of Commerce, National Income and Product Accounts, accounting conventions.

Table 2

Contribution of the food and fiber system to the U.S. economy, 1999

Industry	Value added to GDP	Share of FFS contribution to GDP	Share of GDP	Number of workers	Share of FFS employment	Share of total U.S. employment
	<i>Billion dollars</i>	<i>Percent</i>		<i>Thousands</i>	<i>Percent</i>	
Farm sector	69.8	4.6	0.8	1,714	7.1	1.2
Total inputs	468.4	30.8	5.0	4,720	19.5	3.4
Mining	15.6	1.0	0.2	62	0.3	—
Forestry, fishing and agricultural services	13.2	.9	0.1	409	1.7	0.3
Manufacturing	160.0	10.5	1.7	1,192	4.9	0.9
Services	279.6	18.3	3.0	3,058	12.6	2.2
Total manufacturing and distribution	984.0	64.7	10.6	17,835	73.4	12.8
Manufacturing:						
Food processing	177.7	11.7	1.9	1,296	5.3	0.9
Textiles	45.3	3.0	0.5	993	4.1	0.7
Leather	0.3	—	—	4	—	—
Tobacco	34.5	2.3	0.4	29	0.1	—
Distribution:						
Transportation	49.6	3.3	0.5	596	2.5	0.4
Wholesaling and retailing	460.3	30.2	4.9	8,306	34.2	6.1
Food service	215.5	14.2	2.3	6,606	27.2	4.7
Total food and fiber system	1,521.5	100.0	16.3	24,265	100.0	17.4

— = less than .05 percent.

Source: Calculated by ERS using data from the U.S. Department of Commerce.

Despite Recent Declines, Agricultural Exports Play a Vital Role in the Economy

William Edmondson

Exports make an important contribution to the farm sector and to the U.S. economy as a whole. In calendar year 1999, the United States exported \$48.3 billion worth of agricultural products, down from \$51.8 billion in 1998. Exports rebounded to \$51.6 billion during 2000.

The decline in dollar value of exports is due to low prices for bulk commodities, large world supplies, and global demand weakened by the sluggish economies in Asia, Russia, and Latin America. The U.S. dollar is still strong.

Agricultural exports play an important role in the economy, supporting jobs on farms, in food processing, other manufacturing plants, and in the transportation and trade sectors. Agricultural exports generated an estimated 735,000 jobs in 1999, of which 295,000 were on farms. The impact of agricultural exports on the U.S. economy is far-reaching. Every dollar of exports generated an additional \$1.39 in economic activity in supporting sectors (table 1).

Imports of agricultural products were worth \$37.9 billion in 1999, up from \$37.1 billion in 1998. Agricultural imports rose in calendar year 2000 to \$39 billion.

Since agricultural exports exceeded imports, the United States had a positive trade balance in agricultural products of \$10.4 billion in 1999. This balance shrunk in 1999 and will continue to shrink as agricultural exports fall and imports rise. About \$8 billion worth of imports were such commodities as bananas, coffee, and tea, which do not compete with U.S. products. The remaining \$29.9 billion is comprised of imports—such as meat, dairy products, fruits, nuts, vegetables, sugar, and wines—that compete with U.S. products.

Processed agricultural products have more extensive impacts on the U.S. economy than exports of bulk unprocessed commodities. Nonbulk products account for most of the economic activity generated by agricultural exports. In 1999, they accounted for 370,000 of the 735,000 jobs attributed to agricultural exports. Each dollar of nonbulk agricultural exports (fresh fruits and vegetables and “value-added” processed products) generated an additional \$1.56 in supporting activity, compared with \$1.11 for each dollar of bulk exports

(grains, oilseeds, and cotton). Bulk exports generated more U.S. jobs per \$1 billion of exported commodity than did processed exports. In 1999, \$1 billion of bulk exports supported 20,900 U.S. jobs, compared with 12,100 for nonbulk exports.

Also in 1999, the United States imported more processed or high-value foods than it exported, resulting in a negative trade balance in nonbulk commodities. Part of this shift in trading patterns is due to a redefinition and reclassification, by ERS, of what commodities are “bulk.” Up until 1997, this analysis used U.S. Dept. of Commerce, BEA, and Bureau of Census classifications of commodities. To prevent conflicts with other ERS publications, in 1998, this analysis was switched to an ERS-MTED classification scheme of bulk and nonbulk commodities. **RA**

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Table 1
U.S. economic activity triggered by agricultural trade

Item	1997 total	1998 total	1999		
			Total	Bulk	Other
Billion dollars					
Economic activity generated by agricultural exports	130.8	119.7	115.6	37.4	78.2
Exports	57.3	51.8	48.3	17.7	30.6
Agricultural imports	36.3	37.1	37.9	1.8	36.1
Complementary	9.4	9.0	8.0	0.0	8.0
Competitive	26.9	28.1	29.9	1.8	28.1
Agricultural trade balance	21.0	14.7	10.4	15.9	-5.5
Supporting activities	73.5	67.9	67.3	19.7	47.6
Farm	16.6	14.2	12.8	0.8	12.0
Food processing	6.2	5.7	5.1	.1	5.0
Other manufacturing	16.2	15.1	15.0	5.5	9.5
Trade and transportation	10.9	10.8	11.7	3.5	8.2
Other services	23.6	22.1	22.7	9.7	13.0
Percent					
Nonfarm share of supporting economic activity	77	79	81	96	75
Export multiplier (additional business activity generated by \$1 of exports)	1.28	1.31	1.39	1.11	1.56
1,000 jobs					
Employment generated by agricultural exports	871	808	735	365	370
Farm	321	320	295	205	90
Employment per billion dollars of agricultural exports	15.2	15.6	15.2	20.6	12.1
Percent					
Share of farm workforce supported by agricultural exports	9	9	9	6	3
1,000 jobs					
Nonfarm	550	488	440	160	280
Food processing	90	78	71	0	71
Other manufacturing	76	65	59	25	34
Trade and transportation	175	155	135	58	77
Other services	209	190	175	77	98
Billion dollars					
Domestic equivalent of economic activity generated by competitive imports	63.9	66.7	70.6	3.8	66.8
Net business surplus of agricultural trade	57.5	44.0	45.0	33.5	11.5
Nonfarm, nonfood processing sectors:					
Net direct benefit from exports	6.9	6.4	4.6	3.7	.9
Net increased output from exports	41.6	26.2	20.9	16.7	4.2
Percent					
Farm share of total income from exports	29	27	24	36	17
Trade and transportation share of total income from exports	22.7	23.3	24.5	24.5	24.4

Source: Calculated by ERS using data from the U.S. Department of Commerce.



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